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(54) INK JET RECORDING DEVICE

(57)Abstract:
PROBLEM TO BE SOLVED: To reduce overflow of waste ink generated in making a record on an edge part without a margin from an ink absorber.

SOLUTION: A total quantity of the waste ink is controlled by cumulatively adding the quantity of the waste ink generated following the margin-less recording every time the margin-less recording is carried out. Here, the added quantity of the waste ink is determined at least by either a kind of a recording medium or a recording mode.

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CLAIMS

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[Claim(s)]
[Claim 1] In performing margin-less record over the edge of the record medium supported by the platen It is the ink jet recording device which breathes out ink from a recording head in the location protruded outside the edge of said record medium, and performs record at the edge of said record medium. The ink receptacle section which receives the waste ink breathed out by the location protruded outside the edge of said record medium, An amount addition means of waste ink to add cumulatively the amount of the waste ink breathed out by said ink receptacle section is provided. Said amount addition means of waste ink The ink jet recording device characterized by

adding the value equivalent to the amount of waste ink produced with the margin-less record over the record medium concerned of one sheet at every margin-less record over the record medium of one sheet.

[Claim 2] The value equivalent to the amount of waste ink produced with the margin-less record over said record medium of one sheet is an ink jet recording device according to claim 1 characterized by adding said predetermined value at every margin-less record of as opposed to [ are the predetermined value defined beforehand and ] said record medium of one sheet in said amount addition means of waste ink only once.

[Claim 3] It is the ink jet recording device according to claim 2 which two or more said predetermined values are established corresponding to the class of record medium, and is characterized by said amount addition means of waste ink adding the predetermined value corresponding to the class of record medium used for record.

[Claim 4] It is the ink jet recording device according to claim 2 which two or more said predetermined values are established corresponding to two or more recording modes which contain relatively the mode in which a recording rate is slow, relatively [ mode / in which a recording rate is quick ], and is characterized by said amount addition means of waste ink adding the predetermined value corresponding to the recording mode used for record.

[Claim 5] It is the ink jet recording device according to claim 2 which two or more said predetermined values are established corresponding to the class and recording mode of a record medium, and is characterized by said amount addition means of waste ink adding the predetermined value corresponding to the class and recording mode of a record medium which are used for record.

[Claim 6] It is the ink jet recording device according to claim 2 which two or more said predetermined values are established corresponding to the size of the record data used for record to said record medium, and the size of a record medium, and is characterized by said amount addition means of waste ink adding the predetermined value corresponding to the size of the record data used for record, and the size of a record medium.

[Claim 7] It is the ink jet recording device according to claim 2 which two or more said predetermined values are established corresponding to the size of the class of record medium, a recording mode, and record data, and the size of a record medium, and is characterized by said amount addition means of waste ink adding the predetermined value corresponding to the size of the class of record medium used for record, a recording mode, and record data, and the size of a record medium.

[Claim 8] It is the ink jet recording device according to claim 1 characterized by adding the value as which the value equivalent to the amount of waste ink produced with the margin-less record over said record medium of one sheet is a value defined based on record duty, and said amount addition means of waste ink was determined based on said

record duty.

[Claim 9] It is the ink-jet recording device according to claim 1 characterized by to add the value as which the value equivalent to the amount of waste ink which produces with the margin-less record over said record medium of one sheet is the value defined based on the number of the ink regurgitation data in which it is shown that ink is actually breathed out among the record data corresponding to the field protruded from said record medium, and said amount addition means of waste ink was determined based on the number of said ink regurgitation data.

[Claim 10] In performing margin-less record over the edge of the record medium supported by the platen It is the ink jet recording device which breathes out ink from a recording head in the location protruded outside the edge of said record medium, and performs record at the edge of said record medium. The ink receptacle section which receives the waste ink breathed out by the location protruded outside the edge of said record medium, Whenever margin-less record over a record medium is performed, an amount addition means of waste ink to add cumulatively the value equivalent to the amount of the waste ink breathed out by said ink receptacle section with the margin-less record over the record medium concerned is provided. Said amount addition means of waste ink is an ink jet recording device characterized by adding the value defined as a value equivalent to the amount of said waste ink based on at least one of the sizes of the class of record medium used for record, a recording mode, and record data.

[Claim 11] Said amount addition means of waste ink is an ink jet recording device according to claim 10 characterized by adding the value determined as a value equivalent to the amount of said waste ink based on the class and recording mode of a record medium.

[Claim 12] Said amount addition means of waste ink is an ink jet recording device according to claim 10 characterized by adding the value determined as a value equivalent to the amount of said waste ink based on the size of the record-medium data used for record, and the size of a record medium.

[Claim 13] In performing margin-less record over the edge of the record medium supported by the platen It is the ink jet recording device which breathes out ink from a recording head in the location protruded outside the edge of said record medium, and performs record at the edge of said record medium. The ink receptacle section which receives the waste ink breathed out by the location protruded outside the edge of said record medium, Whenever margin-less record over a record medium is performed, an amount addition means of waste ink to add cumulatively the value equivalent to the amount of the waste ink breathed out by said ink receptacle section with the margin-less record over the record medium concerned is provided. When the class of record medium which uses said amount addition means of waste ink for record is the 1st record medium, When the class of record medium which adds the 1st value as a value equivalent to the amount of said waste ink, and is used for record is the 2nd record medium with which

said 1st record media differ, The ink jet recording device characterized by adding said 1st value and the 2nd different value as a value equivalent to the amount of said waste ink.

[Claim 14] In performing margin-less record over the edge of the record medium supported by the platen It is the ink jet recording device which breathes out ink from a recording head in the location protruded outside the edge of said record medium, and performs record at the edge of said record medium. The ink receptacle section which receives the waste ink breathed out by the location protruded outside the edge of said record medium, Whenever margin-less record over a record medium is performed, an amount addition means of waste ink to add cumulatively the value equivalent to the amount of the waste ink breathed out by said ink receptacle section with the margin-less record over the record medium concerned is provided. When the recording mode which uses said amount addition means of waste ink for record is the 1st quick mode relatively [ a recording rate ], The ink jet recording device characterized by adding the 1st value as a value equivalent to the amount of said waste ink, and adding said 1st value and the 2nd different value as a value equivalent to the amount of said waste ink when the recording mode used for record is the 2nd late mode relatively [ a recording rate ].

[Claim 15] In performing margin-less record over the edge of the record medium supported by the platen It is the ink jet recording device which breathes out ink from a recording head in the location protruded outside the edge of said record medium, and performs record at the edge of said record medium. The ink receptacle section which receives the waste ink breathed out by the location protruded outside the edge of said record medium, Whenever margin-less record over a record medium is performed, an amount addition means of waste ink to add cumulatively the value equivalent to the amount of the waste ink breathed out by said ink receptacle section with the margin-less record over the record medium concerned is provided. When the size of the record data which use said amount addition means of waste ink for record is the 1st size, When the size of the record data which add the 1st value as a value equivalent to the amount of said waste ink, and are used for record is the 2nd size from which said 1st size differs, The ink jet recording device characterized by adding said 1st value and the 2nd different value as a value equivalent to the amount of said waste ink.

[Claim 16] Said ink receptacle section is an ink jet recording device according to claim 1 to 15 characterized by being prepared in the platen arranged in the recording head and the location which counters.

[Claim 17] The ink jet recording device according to claim 1 to 16 characterized by forming the ink absorber which collects waste ink to be breathed out by the location protruded outside the edge of said record medium in the top face of said platen at the ink receptacle section which two or more ribs which support a record medium protrude, and is located between said ribs.

[Claim 18] The ink absorber for collecting the waste ink breathed out by the location

protruded outside the edge of said record medium is formed in said ink receptacle section. Warning actuation is performed when the accumulation value of the amount of waste ink obtained by said amount addition means of waste ink reaches the 1st default value of under the maximum ink absorbed amount of said ink absorber. The ink jet recording device according to claim 1 to 17 characterized by having further the control means which is below the maximum ink absorbed amount of said ink absorber, and performs halt control of record actuation when the 2nd larger default value than said 1st default value is reached.

[Claim 19] The recovery means for performing recovery action which makes ink discharge from said recording head, The waste ink which was further equipped with the waste ink absorber which collects the waste ink produced in connection with the recovery action by said recovery means, and was breathed out by said ink receptacle section In said waste ink absorber, it is held with the waste ink produced in connection with said recovery action. Said amount addition means of waste ink By adding the value equivalent to the amount of the waste ink produced in connection with the recovery action by said recovery means besides the value equivalent to the amount of the waste ink breathed out by said ink receptacle section The ink jet recording device according to claim 18 characterized by integrating the amount of the waste ink in said waste ink absorber.

[Claim 20] The recovery means for performing recovery action which makes ink discharge from said recording head, It has further the waste ink absorber which collects the waste ink produced in connection with the recovery action by said recovery means. The waste ink which said waste ink absorber has been arranged at the lower part section in the gravity direction of an ink absorber established in said ink receptacle circles, and was breathed out by said ink absorber with said margin-less record It moves to said waste ink absorber, and is held in the waste ink absorber concerned. Said amount addition means of waste ink By adding together the value equivalent to the amount of the waste ink breathed out by said ink receptacle section, and the value equivalent to the amount of the waste ink produced in connection with the recovery action by said recovery means The ink jet recording device according to claim 18 characterized by integrating the amount of the waste ink in said waste ink absorber.

[Claim 21] An ink-jet recording device given in either of claims 19 or 20 characterized by to have further the control means which warning actuation performs when the accumulation value of the amount of waste ink obtained by said amount addition means of waste ink reaches the 1st default value of under the maximum ink absorbed amount of said waste ink absorber, is below the maximum ink absorbed amount of said waste ink absorber, and performs halt control of record actuation when the 2nd larger default value than said 1st default value is reached.

[Claim 22] The ink jet recording device according to claim 1 to 21 characterized by having further the control means controlled so that record actuation after it is no longer

performed when the accumulation value of the amount of waste ink obtained by said amount addition means of waste ink reaches default value.

## DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the ink jet recording device which breathes out ink from a recording head and records an image on a record medium, and the ink jet recording device which can perform margin-less record (it is also called frameless record) which records without forming a margin in the edge of a record medium especially.

[0002]

[Description of the Prior Art] Usually, in an ink jet recording device, the ink absorbed and held in a body as waste ink in addition to the ink to which a record medium adheres for the purpose of record is generated. This waste ink is generated, when performing recovery action, such as auxiliary discharge appearance which is explained below, and suction, and when recording, without preparing a margin in the edge of a record medium (this record is hereafter called margin-less record of an edge).

[0003] (Auxiliary discharge appearance) With the nozzle by which the long duration regurgitation is not carried out, by evaporation of the ink component from a nozzle tip, the physical properties of ink change and the poor regurgitation is caused. In order to avoid this, the regurgitation unrelated to record is performed to the auxiliary discharge appearance receptacle in which it was prepared outside the record section. An auxiliary discharge appearance receptacle usually consists of sponge which absorbs ink, and is connected with the waste ink absorber formed in the body. Moreover, auxiliary discharge appearance may be performed in order to discharge color mixture ink from a nozzle also after suction recovery.

[0004] (Suction) When left by the print head, without using it for a long period of time, the head liquid interior of a room may be covered with air bubbles. When a big bubble is generated, a bubble may cover the nozzle section and it may lapse into regurgitation impossible. For this reason, it is necessary to grasp the elapsed time from the last suction recovery action, and to draw in for every predetermined time progress in an ink jet printer. Concrete actuation of this suction is actuation which seals the head nozzle section with a pump and a cap open for free passage, decompresses by pump drive, and pulls out ink from a head nozzle. Under the present circumstances, the air bubbles of the liquid interior of a room can also be discharged to coincidence by raising the degree of reduced pressure and pulling out ink with sufficient vigor. Moreover, the pulled-out ink

is absorbed and held via a pump at the waste ink absorber installed in the body.

[0005] (Margin-less record of an edge) In performing margin-less record (frameless record) of an edge, it performs discharging of ink in range which is protruded from a record medium using the record data which record to the range of a bigger area than the media recorded. Therefore, some ink will not reach the target on a record medium among the breathed-out ink, but the platen located in the outside of a record medium will be reached. For this reason, the ink absorber (platen absorber) for collecting the above-mentioned flash ink was formed in the predetermined range of a platen which flash ink may reach, and this has adopted the structure of preventing the platen contamination in flash ink, in many cases.

[Problem(s) to be Solved by the Invention]

[0006] If margin-less record of an edge is performed as mentioned above, waste ink will be generated at the time of margin-less record else [ at the time of recoveries, such as auxiliary discharge appearance and suction ]. Thus, in spite of having generated waste ink at the time of margin-less record, with the gestalt which manages as usual only the amount of waste ink generated in connection with recovery, this invention persons found out that the following faults arose. That is, with the gestalt which manages only the amount of waste ink at the time of recovery, although the amount of waste ink generated with margin-less record cannot be grasped therefore, the ink overflow from the ink absorber which originates in this waste ink and is produced will not be able to be controlled, but in connection with this, the contamination probability inside equipment will become high.

[0007] The ink absorber which specifically collects the waste ink at the time of recovery (waste ink absorber), With the 1st gestalt which the ink absorber (platen absorber) which collects the waste ink at the time of margin-less record is not opening for free passage Since all the waste ink at the time of margin-less record is held at a platen absorber, it is necessary to manage the amount of waste ink at the time of margin-less record so that the ink total amount driven into this platen absorber may not exceed the amount of absorption limits of a platen absorber. If such management is not performed, the ink overflow from a platen absorber will not be able to be controlled, but the contamination probability of a platen will become high.

[0008] With the 2nd gestalt which the ink absorber (waste ink absorber) which collects the waste ink at the time of recovery, and the ink absorber (platen absorber) which collects the waste ink at the time of margin-less record are opening for free passage on the other hand, the waste ink at the time of margin-less record results in a waste ink absorber through a platen absorber, and is held with this waste ink absorber. That is, the waste ink at the time of margin-less record is held with a waste ink absorber with the waste ink at the time of recovery. Therefore, in addition to the amount of waste ink at the time of recovery, it is necessary in the case of this 2nd gestalt, to manage the total amount of waste ink in a waste ink absorber after also taking into consideration the

amount of waste ink at the time of margin-less record so that the ink total amount held at a waste ink absorber may not exceed the amount of absorption limits of a waste ink absorber. Thus, if not only the amount of waste ink at the time of recovery but the amount of waste ink at the time of margin-less record is not managed collectively, the contamination probability inside equipment which can control the ink overflow from a waste ink absorber will become high.

[0009] As mentioned above, in the ink jet recording device which can perform margin-less record, to manage the amount of waste ink at the time of margin-less record from a viewpoint of reduction of the ink overflow from an ink absorber and reduction of the contamination probability inside equipment is desired so that clearly. Moreover, as for management of the amount of waste ink at the time of this margin-less record, it is desirable to realize with a simple configuration have [ no complicated control processing ] as much as possible.

[0010] This invention is made paying attention to the above-mentioned technical problem, manages the amount of waste ink generated with margin-less record, and aims at offering the ink jet recording device which can fully reduce the ink overflow from an ink absorber.

[0011]

[Means for Solving the Problem] In invention of the 1st of this application performing margin-less record over the edge of the record medium supported by the platen It is the ink jet recording device which breathes out ink from a recording head in the location protruded outside the edge of said record medium, and performs record at the edge of said record medium. The ink receptacle section which receives the waste ink breathed out by the location protruded outside the edge of said record medium, An amount addition means of waste ink to add cumulatively the amount of the waste ink breathed out by said ink receptacle section is provided. Said amount addition means of waste ink It is characterized by adding the value equivalent to the amount of waste ink produced with the margin-less record over the record medium concerned of one sheet at every margin-less record over the record medium of one sheet.

[0012] In invention of the 2nd of this application performing margin-less record over the edge of the record medium supported by the platen It is the ink jet recording device which breathes out ink from a recording head in the location protruded outside the edge of said record medium, and performs record at the edge of said record medium. The ink receptacle section which receives the waste ink breathed out by the location protruded outside the edge of said record medium, Whenever margin-less record over the record medium of predetermined number of sheets is performed, an amount addition means of waste ink to add cumulatively the value equivalent to the amount of the waste ink breathed out by said ink receptacle section with the margin-less record over the record medium of the predetermined number of sheets concerned is provided. Said amount addition means of waste ink It is characterized by adding the value defined as a value

equivalent to the amount of said waste ink based on at least one of the sizes of the class of record medium used for record, a recording mode, and record data.

[0013] In invention of the 3rd of this application performing margin-less record over the edge of the record medium supported by the platen It is the ink jet recording device which breathes out ink from a recording head in the location protruded outside the edge of said record medium, and performs record at the edge of said record medium. The ink receptacle section which receives the waste ink breathed out by the location protruded outside the edge of said record medium, Whenever margin-less record over the record medium of predetermined number of sheets is performed, an amount addition means of waste ink to add cumulatively the value equivalent to the amount of the waste ink breathed out by said ink receptacle section with the margin-less record over the record medium of the predetermined number of sheets concerned is provided. Said amount addition means of waste ink When the class of record medium used for record is the 1st record medium, the 1st value is added as a value equivalent to the amount of said waste ink. The class of record medium used for record is characterized by adding said 1st value and the 2nd different value as a value which is equivalent to the amount of said waste ink when said 1st record medium is the 2nd different record medium.

[0014] In invention of the 4th of this application performing margin-less record over the edge of the record medium supported by the platen It is the ink jet recording device which breathes out ink from a recording head in the location protruded outside the edge of said record medium, and performs record at the edge of said record medium. The ink receptacle section which receives the waste ink breathed out by the location protruded outside the edge of said record medium, Whenever margin-less record over the record medium of predetermined number of sheets is performed, an amount addition means of waste ink to add cumulatively the value equivalent to the amount of the waste ink breathed out by said ink receptacle section with the margin-less record over the record medium of the predetermined number of sheets concerned is provided. Said amount addition means of waste ink When the recording mode used for record is the 1st quick mode relatively [ a recording rate ], It is characterized by adding the 1st value as a value equivalent to the amount of said waste ink, and adding said 1st value and the 2nd different value as a value equivalent to the amount of said waste ink, when the recording mode used for record is the 2nd late mode relatively [ a recording rate ].

[0015] In invention of the 5th of this application performing margin-less record over the edge of the record medium supported by the platen It is the ink jet recording device which breathes out ink from a recording head in the location protruded outside the edge of said record medium, and performs record at the edge of said record medium. The ink receptacle section which receives the waste ink breathed out by the location protruded outside the edge of said record medium, Whenever margin-less record over the record medium of predetermined number of sheets is performed, an amount addition means of waste ink to add cumulatively the value equivalent to the amount of the waste ink

breathed out by said ink receptacle section with the margin-less record over the record medium of the predetermined number of sheets concerned is provided. Said amount addition means of waste ink When the size of the record data used for record is the 1st size, the 1st value is added as a value equivalent to the amount of said waste ink. Size of the record data used for record is characterized by adding said 1st value and the 2nd different value as a value which is equivalent to the amount of said waste ink when said 1st size is the 2nd different size.

[0016]

[Embodiment of the Invention] (Basic configuration) The basic configuration of the ink jet recording device in the gestalt of operation of this invention is first explained based on drawing 1 thru/or drawing 10 .

[0017] In addition, in this specification, not only when forming significant information, such as an alphabetic character and a graphic form, but when not asking whether it actualizes so that significant non-mind may not be asked and human being may perceive visually, forming an image, a pattern, a pattern, etc. on a print medium widely or processing a medium, it shall be called a "print" (it may be called "record").

[0018] Here, it shall be large not only the paper used with a common printing equipment but, and objects [, such as glass, ceramics, wood, and leather, ] which can receive ink, such as cloth, a plastics film, and a metal plate, shall also be called "print medium."

[0019] Furthermore, "ink" (it may be called a "liquid") shall say the liquid with which formation of an image, a pattern, a pattern, etc., processing of a print medium, or processing (for example, coagulation or insolubilization of the color material in the ink given to a print medium) of ink may be presented by being widely interpreted like the definition of the above "a print" and being given on a print medium.

[0020] The outline configuration of the printer which used the ink jet recording method for [body of equipment] drawing 1 and drawing 2 is shown. In drawing 1 , the outline of the body M1000 of equipment of the printer in this operation gestalt consists of a sheathing member containing the bottom case M1001, the upper case M1002, an access cover M1003, and the discharge tray M1004, and a chassis M3019 (refer to drawing 2 ) contained in that sheathing member.

[0021] A chassis M3019 is constituted by two or more tabular metal members which have predetermined rigidity, and holds nothing and each below-mentioned record actuation device for the frame of a recording device.

[0022] Moreover, said bottom case M1001 forms the bottom half section of abbreviation of sheathing of the body M1000 of equipment, the upper case M1002 forms the abbreviation Johan section of sheathing of the body M1000 of equipment, respectively, and the hollow object structure of having the storage space which contains each below-mentioned device inside with the combination of both cases is made. Opening is formed in the top-face section and the front section of the body M1000 of

equipment, respectively.

[0023] Furthermore, the end section can be held free [ rotation in the bottom case M1001 ], and the discharge tray M1004 can open now and close said opening formed in the front section of the bottom case M1001 of the rotation. For this reason, in case record actuation is performed, sequential loading of the record sheet P discharged while discharge of a record sheet was attained from here can be carried out by rotating the discharge tray M1004 to a front-face side, and carrying out Kaisei of the opening. Moreover, auxiliary tray M1004a of two sheets and M1004b are contained, and by pulling out each tray to the front if needed, the back-face product of a form can be expanded to a three-stage, and it can reduce now to a paper output tray M1004.

[0024] An access cover M1003 becomes exchangeable [ the record head cartlidge H1000 contained inside the body, or ink tank H1900 grade ], when that end section can be held free [ rotation in the upper case M1002 ], can open and close now opening formed in a top face and opens this access cover M1003. In addition, although not illustrated especially here, if an access cover M1003 is made to open and close, when the projection formed in the rear face rotates a covering closing motion lever and detects the rotation location of the lever with a microswitch etc., the switching condition of an access cover can be detected.

[0025] Moreover, it is LED while the power-source key E0018 and the resume key E0019 are formed in the posterior part top face of the upper case M1002 possible [ a depression ]. It is LED, when E0020 is prepared and the depression of the power-source key E0018 is carried out. The operator is told about the ability for E0020 to turn on and record. Moreover, LED E0020 has various display functions, such as carrying out the method of flashing, and change of a color, or telling an operator about the trouble of a printer etc. Furthermore, a buzzer E0021 ( drawing 7 ) can also be sounded. In addition, when a trouble etc. is solved, record is resumed by carrying out the depression of the resume key E0019.

[0026] The record actuation device in this operation gestalt which is contained by a [record actuation device], next the body M1000 of equipment of a printer, and is held is explained.

[0027] While leading record sheet P sent out one sheet at a time as a record actuation device in this operation gestalt from the automatic feeding section M3022 which feeds with record sheet P automatically into the body of equipment, and the automatic feeding section to a predetermined record location It consists of the conveyance section M3029 which leads record sheet P to the discharge section M3030 from a record location, the Records Department which records a request on record sheet P conveyed in the record location, and the recovery section which performs recovery to said Records Department etc.

[0028] (Records Department) Here, that Records Department is explaining the Records Department from the carriage M4001 supported movable with the carriage shaft M4021,

and the record head cartlidge H1000 carried in this carriage M4001 removable.

[0029] The record head cartlidge used for record head cartlidge **** and the Records Department is explained based on drawing 3 -5.

[0030] The record head cartlidge H1000 in this operation gestalt has the ink tank H1900 which stores ink as shown in drawing 3 , and the recording head H1001 which makes the ink supplied from this ink tank H1900 breathe out from a nozzle according to recording information. The recording head H1001 has taken the so-called cartridge type carried removable to the carriage M4001 mentioned later.

[0031] As shown in drawing 4 , each can detach [ since color record / high definition photograph tone / is enabled / as an ink tank, / black, light cyanogen, a light Magenta, cyanogen, the Magenta, and the ink tank H1900 of each color independence of yellow are prepared, and ] in the record head cartlidge H1000 shown here, and attach freely to a recording head H1001.

[0032] And the recording head H1001 consists of the record component substrate H1100, the 1st plate H1200, the electric wiring substrate H1300, the 2nd plate H1400, the tank electrode holder H1500, a passage formation member H1600, a filter H1700, and seal rubber H1800, as shown in the decomposition perspective view of drawing 5 .

[0033] Electric wiring, such as aluminum which supplies power to two or more record component and each record component for carrying out the regurgitation of the ink to one side of Si substrate, is formed by the membrane formation technique, and while two or more ink passage corresponding to this record component and two or more delivery H1100T are formed by the photolithography technique, it is formed in the record component substrate H1100 so that the ink feed hopper for supplying ink to two or more ink passage may carry out opening to a rear face. Moreover, adhesion immobilization of the record component substrate H1100 is carried out at the 1st plate H1200, and the ink feed hopper H1201 for supplying ink to said record component substrate H1100 is formed here. Furthermore, adhesion immobilization of the 2nd plate H1400 which has opening is carried out at the 1st plate H1200, and through this 2nd plate H1400, it is held so that the electric wiring substrate H1300 may be electrically connected to the record component substrate H1100. This electric wiring substrate H1300 impresses the electrical signal for carrying out the regurgitation of the ink to the record component substrate H1100, it has the electric wiring corresponding to the record component substrate H1100, and the external signal input terminal H1301 for being located in this electric wiring edge and receiving the electrical signal from a body, and positioning immobilization of the external signal input terminal H1301 is carried out at the tooth-back side of the below-mentioned tank electrode holder H1500.

[0034] On the other hand, ultrasonic welding is fixed and the passage formation member H1600 forms the ink passage H1501 ranging from the ink tank H1900 to the 1st plate H1200 in the tank electrode holder H1500 which holds the ink tank H1900 removable. Moreover, the filter H1700 is formed in the ink tank side edge section of the

ink passage H1501 which engages with the ink tank H1900, and invasion of the dust from the outside can be prevented now. Moreover, the engagement section with the ink tank H1900 can be equipped with seal rubber H1800, and evaporation of the ink from the engagement section can be prevented now.

[0035] Furthermore, the recording head H1001 is constituted by combining the tank electrode-holder section which consists of the tank electrode holder H1500, a passage formation member H1600, a filter H1700, and seal rubber H1800 as mentioned above, and the record component section which consists of said record component substrate H1100, the 1st plate H1200, an electric wiring substrate H1300, and the 2nd plate H1400 by adhesion etc.

[0036] Carriage, next the carriage M4001 which carries the record head cartlidge H1000 with reference to drawing 2 are explained.

[0037] As shown in drawing 2 , it engages with the carriage covering M4002 for engaging with carriage M4001 and showing a recording head H1001 to the predetermined stowed position on carriage M4001, and the tank electrode holder H1500 of a recording head H1001, and the head set lever M4007 pressed so that a recording head H1001 may be made to set to a predetermined stowed position is formed in carriage M4001. That is, the engagement section with a recording head H1001 is equipped with the head set plate (un-illustrating) by which spring energization is carried out, and the head set lever M4007 has composition with which carriage M4001 is equipped, pressing a recording head H1001 according to this spring force while being formed in the upper part of carriage M4001 rotatable to a head set lever shaft.

[0038] Moreover, the contact flexible printed cable (Contact FPC is called refer to drawing 7 and the following) E0011 is formed in another engagement section with the recording head H1001 of carriage M4001, and it is Contact FPC. The contact section on E0011 and the contact section (external signal input terminal) H1301 prepared in the recording head H1001 can contact electrically, and can perform now transfer of the various information for record, supply of the power to a recording head H1001, etc.

[0039] It is Contact FPC here. Elastic members, such as non-illustrated rubber, are prepared between the contact section of E0011, and carriage M4001, and positive contact on the contact section and carriage M4001 is enabled by the elastic force of this elastic member, and thrust with a head set lever spring. Furthermore, it is said contact FPC. E0011 is connected to the carriage substrate E0013 carried in the tooth back of carriage M4001 (refer to drawing 7 ).

[0040] [Scanner] The printer in this operation gestalt can be used also as a reader by equipping carriage M4001 with a scanner instead of the record head cartlidge H1000 mentioned above.

[0041] The manuscript image information of one sheet can be read by this scanner's moving to a main scanning direction with the carriage M4001 by the side of a printer, reading in process of migration to that main scanning direction of the manuscript image

with which replaced with the record medium and it was fed, and performing reading actuation of that main scanning direction, and feed actuation of the direction of vertical scanning of a manuscript by turns.

[0042] In order that drawing 6 may explain the outline configuration of this scanner M6000, it is drawing showing a scanner M6000, and (a) shows a top-face side and (b) shows a base side, respectively.

[0043] Like illustration, the scanner holder M6001 is the configuration of an abbreviation core box, and optical system, a processing circuit, etc. required for reading are contained by the interior. Moreover, when carriage M4001 is equipped with this scanner M6000, the read station lens M6006 is formed in the part which meets a manuscript side, and a manuscript image is read by converging the reflected light from a manuscript side on an internal read station with this lens M6006. On the other hand, the lighting section lens M6005 has the non-illustrated light source inside, and the light emitted from the light source is irradiated through a lens M6005 to a manuscript.

[0044] The scanner covering M6003 fixed to the pars basilaris ossis occipitalis of the scanner holder M6001 fits in so that the scanner holder M6001 interior may be shaded, and it is aiming at improvement in the attachment-and-detachment operability to carriage M4001 by the grasping section of the shape of a louver prepared in the side face. The appearance configuration of the scanner holder M6001 has the shape of a recording head H1001 and abbreviation isomorphism, and can be detached and attached by the same actuation as the record head cartlidge H1000 to carriage M4001.

[0045] Moreover, while the substrate which has a read processing circuit is contained by the scanner holder M6001 It is prepared so that the scanner contact PCB connected to this substrate may be outside exposed. When carriage M4001 is equipped with a scanner M6000, it is the scanner contact PCB. M6004 is the contact FPC by the side of carriage M4001. E0011 is contacted. A substrate is electrically connected to the control system by the side of a body through carriage M4001.

[0046] [The configuration of the electrical circuit of a printer], next the electric circuitry in the operation gestalt of this invention are explained. Drawing 7 is drawing showing roughly the whole electric circuit example of a configuration in this operation gestalt.

[0047] The electric circuit in this operation gestalt is mainly constituted by the carriage substrate (CRPCB) E0013, Maine PCB(Printed Circuit Board) E0014, and power supply unit E0015 grade. Here, a power supply unit E0015 is Maine PCB. It connects with E0014 and various drive power sources are supplied.

[0048] Moreover, the carriage substrate E0013 is the printed circuit board unit carried in carriage M4001 ( drawing 2 ). Contact FPC Function as an interface which delivers and receives a signal with a recording head through E0011, and also It is based on the pulse signal outputted from the encoder sensor E0004 with migration of carriage M4001. Change of the physical relationship of the encoder scale E0005 and the encoder sensor E0004 is detected, the flexible flat cable (CRFFC) E0012 is led in the output signal, and

it is Maine PCB. It outputs to E0014.

[0049] Furthermore, Maine PCBE0014 is a printed circuit board unit which manages drive control of each part of the ink jet recording device in this operation gestalt, and is the paper end detection sensor (PE sensor) E0007, the ASF (automatic feeding equipment) sensor E0009, the covering sensor E0022, a parallel interface (parallel I/F) E0016, serial interface (serial I/F) E0017, and the resume keys E0019 and LED. It has an I/O Port to E0020, the power-source key E0018, and buzzer E0021 grade on a substrate. moreover, further Carriage M1400 The driving source for carrying out horizontal scanning Connect with the motor (LF motor) E0002 which makes the driving source for conveying the motor (CR motor) E0001 and record medium to make, and the motor (PG motor) E0003 used also [ actuation / of a record medium / rotation actuation of a recording head, and / feed ], and control these drives, and also The ink empty sensor E0006, the GAP sensor E0008, the PG sensor E0010, CRFFC It has E0012 and a connection interface with a power supply unit E0015.

[0050] Drawing 8 is Maine PCB. It is the block diagram showing the internal configuration of E0014. In drawing, E1001 is CPU and it is this CPU. E1001 is the clock generator (PCG) connected to the interior in the oscillator circuit E1005. It has E1002 and a system clock is generated with that output signal E1019. Moreover, a control bus E1014 is led and it is ROM. E1004 and ASIC (Application Specific Integrated Circuit) It connects with E1006. The program stored in ROM is followed and it is ASIC. Control of E1006, The condition of the input signal E1017 from a power-source key and the input signal E1016 from a resume key, the covering detecting signal E1042, and the head detecting signal (HSENS) E1013 is detected. Furthermore, a buzzer E0021 is driven with the buzzer signal (BUZ) E1018. While detecting the condition of temperature detecting-signal (TH) E1012 by the ink empty detecting signal (INKS) E1011 and thermistor which are connected to A/D converter E1003 built in In addition, various logical operation, conditional judgment, etc. are performed, and drive control of an ink jet recording device is managed.

[0051] Here, the head detecting signal E1013 is a head loading detecting signal inputted through the flexible flat cable E0012, the carriage substrate E0013, and the contact flexible printed cable E0011 from the record head cartlidge H1000, and the analog signal with which the ink empty detecting signal E1011 is outputted from the ink empty sensor E0006, and the temperature detecting signal E1012 are analog signals from a thermistor (not shown) established on the carriage substrate E0013.

[0052] E1008 is CR Motor Driver, makes a driving source motor (power-source VM) E1040, and is ASIC. According to CR motor control signal E1036 from E1006, the CR motorised signal E1037 is generated and the CR motor E0001 is driven. E1009 is LF / PG Motor Driver, makes the motor power source E1040 a driving source, and is ASIC. While generating the LF motorised signal E1035 according to the pulse motor control signal (PM control signal) E1033 from E1006 and driving LF motor by this, the PG

motorised signal E1034 is generated and PG motor is driven.

[0053] E1010 is a power control circuit and is ASIC. The current supply to each sensor which has a light emitting device according to the power control signal E1024 from E1006 is controlled. Parallel I/F E0016 is ASIC. The parallel I/F signal E1030 from E1006 is transmitted to the parallel I/F cable E1031 connected outside, and it is ASIC about the signal of the parallel I/F cable E1031. It transmits to E1006. Serial I/F E0017 is ASIC. The serial I/F signal E1028 from E1006 is transmitted to the serial I/F cable E1029 connected outside, and it is ASIC about the signal from this cable E1029. It transmits to E1006.

[0054] On the other hand, from a power supply unit E0015, head power-source (VH) E1039 and motor (power-source VM) E1040, and the logic power source (VDD) E1041 are supplied. Moreover, ASIC The head power-source ON signal (VHON) E1022 from E1006 and the motor power-source ON signal (VMOM) E1023 are inputted into a power supply unit E0015, and control ON/OFF of the head power source E1039 and the motor power source E1040, respectively. The logic power source (VDD) E1041 supplied from the power supply unit E0015 is Maine PCB after electrical-potential-difference conversion is carried out if needed. Each part of E0014 inside and outside is supplied.

[0055] Moreover, the head power-source signal E1039 is Maine PCB. After graduating on E0014, it is sent out to the flexible flat cable E0011, and it is used for the drive of the record head cartlidge H1000.

[0056] E1007 is a reset circuit, detects the fall of the logic supply voltage E1041, and is CPU. E1001 and ASIC It initializes by supplying a reset signal (RESET) E1015 to E1006.

[0057] This ASIC E1006 is the semiconductor integrated circuit of one chip, leads a control bus E1014, and is CPU. It is controlled by E1001. CR motor control signal E1036 mentioned above, the PM control signal E1033, the power control signal E1024, the head power-source ON signal E1022, and motor power-source ON signal E1023 grade are outputted. Parallel I/F E0016 and serial I/F Deliver and receive the signal of E0017, and also PE detecting signal from the PE sensor E0007 The GAP detecting signal E1027 from the sensor (GAP) sensor E0008 for detecting the gap of E1025, the ASF detecting signal (ASFS) E1026 from the ASF sensor E0009, a recording head, and a record medium (GAPS), (PES) The condition of the PG detecting signal (PGS) E1032 from the PG sensor E0010 is detected. A control bus E1014 is led in the data showing the condition, and it is CPU. It transmits to E1001, is based on the inputted data, and is CPU. E1001 controls the drive of the LED driving signal E1038, and blinks LEDE0020.

[0058] Furthermore, the condition of the encoder signal (ENC) E1020 is detected, a timing signal is generated, an interface with the record head cartlidge H1000 is taken with the head control signal E1021, and record actuation is controlled. In here, the encoder signal (ENC) E1020 is an output signal of CR encoder sensor E0004 inputted

through the flexible flat cable E0012. Moreover, the head control signal E1021 is the flexible flat cable E0012, the carriage substrate E0013, and Contact FPC. A recording head H1000 is supplied through E0011.

[0059] Drawing 9 is ASIC. It is the block diagram showing the example of an internal configuration of E1006.

[0060] In addition, in this drawing, about the connection during each block, only the data flow in connection with control of heads and each part mechanism elements, such as record data and motor control data, is shown, and the control signal concerning R/W of the register built in each block, a clock, the control signal in connection with DMA control, etc. are omitted in order to avoid complicated-ization of the publication on a drawing.

[0061] It is CPU, as E2002 is a PLL controller and it is shown in drawing 9 among drawing. By the clock signal (CLK) E2031 and the PLL control signal (PLLON) E2033 which are outputted from E1001, it is ASIC. The clock (not shown) supplied to most in E1006 is generated.

[0062] Moreover, E2001 is a CPU interface (CPUI/F). Reset signals E1015 and CPU With the software reset signal (PDWN) E2032 outputted from E1001, a clock signal (CLK) E2031, and the control signal from a control bus E1014 Control of the register R/W to each block which is explained below etc., Supply which is a clock to a block a part, registration of an interruput signal, etc. are performed (neither is illustrated), and it is CPU. An interruput signal (INT) E2034 is outputted to E1001, and it is ASIC. Generating of interruption in the E1006 interior is told.

[0063] Moreover, while E2005 is DRAM and having each field, such as a receive buffer E2010, the work-piece buffer E2011, a print buffer E2014, and the data buffer E2016 for expansion, as a data buffer for record As a buffer which has the motor control buffer E2023 as an object for motor control, and is further used at the time of a scanner mode of operation It has fields, such as the scanner incorporation buffer E2024 used replacing with each above-mentioned data buffer for record, the scanner data buffer E2026, and the sending-out buffer E2028.

[0064] Moreover, this DRAM E2005 is CPU. It is used also as a work-piece field required for actuation of E1001. That is, E2004 is CPU are a DRAM control section and according to a control bus. From E1001 to DRAM From the DMA control section E2003 to access to E2005, and DRAM mentioned later Access to E2005 is changed and it is DRAM. R/W actuation to E2005 is performed.

[0065] In the DMA control section E2003, the request (not shown) from each block is received, in an address signal, a control signal (not shown), and write-in actuation, the write-in data E2038, E2041, E2044, E2053, E2055, and E2057 etc. are outputted at the DRAM control section E2004, and DRAM access is performed. Moreover, in read-out, the read-out data E2040, E2043, E2045, E2051, E2054, E2056, E2058, and E2059 from the DRAM control section E2004 are delivered at the block of a requesting agency.

[0066] Moreover, E2006 is IEEE. It is 1284 I/F and is CPUI/F. CPU through E2001 By control of E1001 Parallel I/F Perform a two-way communication interface with the external host device which is not illustrated through E0016, and also At the time of record, it is parallel I/F. The received data (PIF received data E2036) from E0016 are delivered to the reception-control section E2008 by DMA processing. At the time of scanner reading, it is DRAM. The data (1284 transmit data E2059 (RDPIF)) stored in the sending-out buffer E2028 in E2005 are transmitted to parallel I/F by DMA processing.

[0067] E2007 is Universal-Serial-Bus (USB) I/F, and is CPUI/F. CPU through E2001 By control of E1001 Perform a two-way communication interface with the external host device which is not illustrated through serial I/FE0017, and also At the time of printing, it is serial I/F. The received data (USB received data E2037) from E0017 are delivered to the reception-control section E2008 by DMA processing. At the time of scanner reading, it is DRAM. It is serial I/F by DMA processing about the data (USB transmit data E2058 (RDUSB)) stored in the sending-out buffer E2028 in E2005. It transmits to E0017. The reception-control section E2008 is 1284 I/F. E2006 or USBI/F The received data (WDIF) E2038 from I/F with which it was chosen of E2007 are written in the receive buffer write-in address which the receive buffer control section E2039 manages.

[0068] E2009 is compression / expanding DMA controller, and is CPUI/F. By control of CPUE1001 through E2001, the received data (raster data) stored on the receive buffer E2010 are read from the receive buffer read-out address which the receive buffer control section E2039 manages, compression and expanding of are done according to the mode in which the data (RDWK) E2040 was specified, and it writes in a work-piece buffer area as a record code train (WDWK) E2041.

[0069] E2013 is a record buffer transfer DMA controller, and is CPUI/F. CPU through E2001 The record code (RDWP) E2043 on the work-piece buffer E2011 is read by control of E1007, and each record code is rearranged and transmitted to the address on the print buffer E2014 which is suitable in order of the data transfer to the record head cartlidge H1000 (WDWP E2044). Moreover, E2012 is a work-piece clear DMA controller, and is CPUI/F. CPU through E2001 It is a record buffer transfer DMA controller by control of E1001. The specified work-piece philharmonic data (WDWF) E2042 are repeated and written in to the field on the work-piece buffer which the transfer by E2013 completed.

[0070] E2015 is a record data-expansion DMA controller, and is CPUI/F. CPU through E2001 The record code which rearranged on the print buffer by control of E1001 by having made the data expansion timing signal E2050 from the head control section E2018 into the trigger, and was written in, and the data for expansion written in on the data buffer E2016 for expansion are read, and it writes in the column buffer E2017 by using the expansion record data (RDHDG) E2045 as the column buffer write-in data (WDHDG) E2047. Here, the column buffer E2017 is SRAM which stores temporarily

the transfer data (expansion record data) to the record head cartlidge H1000, and share management is carried out by the handshaking signal (not shown) of record data expansion DMA controller E2015 and the head control section E2018 with both blocks.

[0071] E2018 is a head control section and is CPUI/F. CPU through E2001 By control of E1001, an interface with the record head cartlidge H1000 or a scanner is performed through a head control signal, and also the data expansion timing signal E2050 is outputted to a record data expansion DMA controller based on the head drive timing signal E2049 from the encoder signal-processing section E2019.

[0072] Moreover, according to said head drive timing signal E2049, at the time of printing, the expansion record data (RDHD) E2048 are read from a column buffer, and it outputs to the record head cartlidge H1000 by making the data into the head control signal E1021 at it.

[0073] Moreover, it is DRAM about the incorporation data (WDHD) E2053 inputted as a head control signal E1021 in scanner read mode. A DMA transfer is carried out to the scanner incorporation buffer E2024 on E2005. E2025 is a scanner data-processing DMA controller, and is CPUI/F. It is DRAM about the processed data (WDAV) E2055 which were stored in the scanner incorporation buffer E2024 by control of CPUE1001 through E2001 and which incorporated, read the buffer read-out data (RDAV) E2054, and processed equalization etc. It writes in the scanner data buffer E2026 on E2005.

[0074] E2027 is a scanner data compression DMA controller, and is CPUI/F. CPU through E2001 By control of E1001, the processed data (RDYC) E2056 on the scanner data buffer E2026 are read, a data compression is performed, and the write-in transfer of the compressed data (WDYC) E2057 is carried out at the sending-out buffer E2028.

[0075] E2019 is the encoder signal-processing section, receives an encoder signal (ENC), and is CPU. The information in connection with the location and rate of carriage M4001 which the head drive timing signal E2049 is outputted according to the mode defined by control of E1001, and also are obtained from the encoder signal E1020 is stored in a register, and it is CPU. It provides for E1001. CPU E1001 determines the various parameters in control of the CR motor E0001 based on this information. Moreover, E2020 is CR motor control section, and is CPUI/F. CPU through E2001 By control of E1001, CR motor control signal E1036 is outputted.

[0076] In response to each detecting signals E1033, E1025, E1026, and E1027 which are the sensor signal-processing sections and are outputted from the PG sensor E0010, the PE sensor E0007, the ASF sensor E0009, and GAP sensor E0008 grade, such sensor information is transmitted to CPUE1001 according to the mode defined by control of CPUE1001, and also E2022 is LF / DMA controller for PG motor control. The sensor appearance signal E2052 is outputted to E2021.

[0077] DMA controller E2021 for LF/PG motor control is CPUI/F. CPU through E2001 By control of E1001, it is DRAM. Read the pulse motor drive table (RDPM) E2051 from the motor control buffer E2023 on E2005, and the pulse motor control signal

E1033 is outputted, and also the pulse motor control signal E1033 is outputted as a trigger of control of said sensor appearance signal in a mode of operation.

[0078] Moreover, E2030 is an LED control section and is CPUI/F. CPU through E2001 The LED driving signal E1038 is outputted by control of E1001. Furthermore, E2029 is a port control section and is CPUI/F. CPU through E2001 By control of E1001, the head power-source ON signal E1022, the motor power-source ON signal E1023, and the power control signal E1024 are outputted.

[0079] [Actuation of a printer], next actuation of the ink jet recording apparatus in the operation gestalt of this invention constituted as mentioned above are explained based on the flow chart of drawing 10 .

[0080] If the body 1000 of equipment is connected to an AC power, at step S1, 1st initialization processing of equipment will be performed first. In this initialization processing, electrical circuit systems, such as a check of ROM and RAM of this equipment, are checked, and it checks whether this equipment can operate normally electrically.

[0081] Next, at step S2, when it judges whether the power-source key E0018 prepared in the upper case M1002 of the body M1000 of equipment was turned on and the power-source key E0018 is pressed, it shifts to the following step S3, and 2nd initialization processing is performed here.

[0082] In this 2nd initialization processing, the various drives of this equipment and the check of a recording head are performed. That is, it faces performing initialization of various motors, and reading of head information, and checks whether equipment can operate normally.

[0083] Next, waiting for an event is performed in step S4. That is, if a command event, a panel key event by user actuation, an internal control event, etc. from external I/F are supervised and these events occur to this equipment, processing corresponding to the event concerned will be performed.

[0084] For example, when the printing command event from external I/F is received by step S4, it shifts to step S5, when the power-source key event by user actuation occurs at this step, it shifts to step S10, and when other events occur at this step, it shifts to step S11.

[0085] It is RAM in this equipment about the data which analyze the printing command from external I/F, judge a paper size, printing grace, the feed approach, etc. the specified paper type exception, and express the decision result with step S5 here. It memorizes to E2005 and progresses to step S6.

[0086] Subsequently, at step S6, feeding is started by the feed approach specified at step S5, and a form is progressed to delivery and step S7 to a recording start location.

[0087] Record actuation is performed at step S7. While once storing in a record buffer the record data sent out from external I/F in this record actuation, driving the CR motor E0001 subsequently and starting migration to the main scanning direction of carriage

M4001 After supplying the record data stored in the print buffer E2014 to a recording head H1001, performing record of one line and completing record actuation of the record data for one line, the LF motor E0002 is driven, the LF roller M3001 is rotated, and a form is sent in the direction of vertical scanning. Then, after repeating and performing the above-mentioned actuation and completing record of the record data for 1 page from external I/F, it progresses to step 8.

[0088] The LF motor E0002 is driven, the delivery roller M2003 is driven, and at step S8, paper feed is repeated, and when it ends, a form will be in the condition that paper was completely delivered on paper output tray M1004a, until it is judged that the form was completely sent out from this equipment.

[0089] Next, when the page which should judge and record whether record actuation of all the pages that should be recorded was completed in step S9 remains, it returns to step S5, and when record actuation of all the pages that should repeat and record actuation to the above-mentioned step S5 - S9 is completed hereafter, it ends, and record actuation shifts to step S4 after that, and waits for the following event.

[0090] On the other hand, at step S10, a printer post process is performed and actuation of this equipment is stopped. That is, in order to disconnect power sources, such as various motors and a head, after shifting to the condition that a power source can be disconnected, a power source is disconnected, and it progresses to step S4, and waits for the following event.

[0091] Moreover, at step S11, other event processing other than the above is performed. For example, processing corresponding to the recovery command from the various panel keys and external I/F of this equipment, the recovery event generated internally is performed. In addition, it progresses to step S4 after processing termination, and waits for the following event.

[0092] In addition, one gestalt for which this invention is used effectively is a gestalt which a liquid is made to produce film boiling using the heat energy which an electric thermal-conversion object generates, and forms air bubbles.

[0093] (Characteristic configuration) Next, the characteristic configuration in the operation gestalt of this invention is explained based on a drawing. In addition, the ink jet recording device in this operation gestalt is equipped with the above-mentioned fundamental configuration shown in drawing 1 thru/or drawing 10 .

[0094] Drawing 11 is drawing showing the configuration of the platen used in this operation gestalt. In drawing 11 , the ribs 11 and 12 which project towards the upper part are projected and formed in the platen 10 which countered the recording head H1001 which moves with carriage M4001, and was prepared in the abbreviation horizontal. For this reason, it is conveyed in the direction (the direction of vertical scanning) of Y in drawing with a conveyance roller (here, not shown), a record medium P being supported by the top face of each ribs 11 and 12. Moreover, between a rib 11 and a rib 12, the slot 14 (it is also called the ink receptacle section) for receiving the

waste ink breathed out by the location protruded outside the edge of a record medium at the time of the record (margin-less record) over the edge of a record medium exists, and the ink absorber (it is also called a platen absorber) 13 which absorbs ink is held at the lower part of the slot 14, and the lower part between each rib.

[0095] And in this operation gestalt that has the above platen 10 and its circumference structure, margin-less record of an edge is performed to the record medium P in the procedure as shown in drawing 12 .

[0096] That is, as the ink jet recording device in this operation gestalt was shown also in the above-mentioned basic configuration, synchronizing with the record actuation to the main scanning direction (the direction of X) by the recording head H1001, it is what performs intermittently conveyance actuation to the direction of vertical scanning of a record medium, and a platen 10 is fed with a record medium P by the feed device at the beginning of record actuation initiation. Under the present circumstances, the tip Pa of the record medium P with which it was fed stops on the slot 14 formed between the ribs 11 and ribs 12 which were formed in platen 10 top face (refer to drawing 12 (a)).

[0097] Subsequently, make the carriage M4001 which carried the recording head 22 scan along a main scanning direction X, an ink droplet is made to breathe out from a recording head H1001 to a record medium P, and it records to the point Pa of a record medium P (refer to drawing 12 (b)). The record data used at this time are data of bigger size than a record medium P. For this reason, the regurgitation of the ink by record data is performed to the location beyond the tip Pa of a record medium P, and an image is certainly formed to the tip Pa of a record medium P. However, the ink (waste ink) breathed out in the location where the regurgitation of ink is performed also to the location from which it separated from the tip Pa of a record medium P, and a record medium P does not exist reaches the ink absorber 13 (platen absorber) formed among the above-mentioned ribs 11 and 12, and is absorbed and held here.

[0098] Moreover, since the record data of bigger size than a record medium are supplied like the record actuation to a point also to the edge of right and left of a record medium, while ink is certainly breathed out by the right-and-left both ends of a record medium P with the record data, the regurgitation of ink is performed also in the location from which it separated from the right-and-left both ends of a record medium P to the side. The ink (waste ink) breathed out by the location from which it separated to the side of this record medium P is also absorbed and held by the ink absorber 13 (platen absorber) formed in the platen 10.

[0099] Next, after the record actuation for one line is completed, from the next record actuation, by rotation of the LF roller M3001 formed in the conveyance device, a record medium P is moved in the conveyance direction Y, and in connection with it, record actuation is performed and it goes. And the back end section Pa of the record medium P which reached on Platen P stops on said slot 14, and performs record actuation to the back end section of a record medium 1 here. After this, since the record data of bigger

size than a record medium P are supplied also in the record actuation to an edge, while ink is certainly breathed out by the back end section Pb with that record data, the regurgitation of ink is performed also in the location from which it separated from the back end Pb of a record medium P to the method of outside. The ink breathed out by the location from which it separated from the back end Pb of this record medium P is also absorbed and held by the ink absorber 13 (platen absorber) formed in Platen P (refer to drawing 12 (c)).

[0100] In addition, in this operation gestalt, since the ink (waste ink at the time of margin-less record) breathed out by the location from which it separated from the record medium P reaches a platen absorber, the above-mentioned waste ink adheres to the interior of an ink jet recording device (for example, platen), and it does not soil the inside of the body of equipment. Moreover, the rear face of a record medium P does not become dirty, without a record medium P touching the platen absorber located caudad, in order that the upper limit side of ribs 11 and 12 may move a record medium P being supported.

[0101] By the way, when margin-less record of an edge is performed as mentioned above and the ink (waste ink) breathed out by the ink absorber 13 exceeds the predetermined amount of conventions (the amount of absorption limits), there is a possibility that waste ink may overflow the ink absorber 13. In order to reduce this ink overflow, the following waste ink managements are performed in this 1st operation gestalt. With this 1st operation gestalt, whenever it performs margin-less record to the record medium of one sheet, every [ namely, ] "The predetermined value defined beforehand" is sent out only once to a counter as an amount of waste ink accompanying this margin-less record. The waste ink total amount breathed out by the ink absorber 13 is managed so that this value may be cumulatively added in a counter (addition) and the accumulation value (total amount of waste ink) integrated by doing in this way may not exceed the above-mentioned amount of conventions (the amount of absorption limits). In addition, the information (here predetermined value) about the amount of waste ink accompanying one margin-less record is acquired, and the information (predetermined value) sent out by amount information acquisition means of waste ink to send out this information to a counter, and the amount information acquisition means of waste ink is cumulatively called the amount addition means of waste ink including an addition (it integrates) counter.

[0102] The configuration which adds to a counter the fixed predetermined value which set at every activation of the margin-less record (henceforth one margin-less record) over the record medium of one sheet beforehand, and was made it with this operation gestalt here is adopted. If it takes into consideration that the amount of waste ink breathed out by overflowing a record medium changes with record images, a fixed predetermined value will not be added, but the amount of waste ink according to a record image will be computed for whenever [ of margin-less record / every ], and it

will be thought that the configuration of adding the calculation value may be used. However, he determines the amount of waste ink accompanying one margin-less record as a "predetermined value", and is trying to add this predetermined value with this operation gestalt with emphasis on managing the amount of waste ink with an easy configuration. Hereafter, the reason which makes the amount of waste ink the fixed "predetermined value" is explained.

[0103] In margin-less record, the ink driven in near the edge of a record medium exists, but it is difficult to specify correctly any [ the edge of a record medium and ] of a platen absorber these ink reaches. it does not restrict that the record medium conveyed with record actuation moves correctly in accordance with an ideal conveyance path, but a skew carries out depending on the case, and an ideal conveyance path is because the amount of ink (the amount of waste ink) which a different conveyance path may be passed, and the location of the ink which begins to see and is breathed out changes from a record medium in this case, and reaches a platen absorber in connection with this differs from a predetermined value. Therefore, it is difficult to manage strictly the amount of ink which reaches a platen absorber. If it is going to manage strictly the amount of ink which reaches a platen absorber, the need of managing strictly medium conveyance conditions, such as the amount of skews of a record medium, will arise, but in order to manage a medium conveyance condition strictly, complicated control processing of detecting a medium conveyance condition is needed. Furthermore, for strict management of the amount of waste ink, the need of counting correctly the number of data of the ink breathed out by overflowing a record medium is produced, and such count processing makes management processing of the amount of waste ink complicate, and also becomes the factor which carries out a cost rise. And as for such complicated management processing or a cost rise, avoiding as much as possible is desirable.

[0104] So, with this operation gestalt, in order to ****** complicated management processing and to manage the amount of waste ink, the amount of waste ink in one margin-less record is beforehand fixed as a "predetermined value", and it is considering as the configuration adding such a "predetermined value." In addition, in order to prevent the ink overflow from a platen absorber certainly, it is desirable to define the maximum amount of waste ink which may be assumed in one margin-less record as a "predetermined value." According to such a configuration, there is no time and effort which computes the amount of waste ink in one margin-less record each time, since the fixed predetermined value defined beforehand is only added, cannot require complicated management processing, it can be carried out and the amount of waste ink accompanying margin-less record can be grasped. Moreover, since it is considering as the configuration which adds the above-mentioned predetermined value only once every whenever it performs margin-less record over the record medium of one sheet, shortening of the processing time which calculation processing of the amount of waste

ink takes the amount of waste ink breathed out by each four-directions edge compared with the configuration added separately, and simplification of processing are realizable. Furthermore, it can prevent certainly that a waste ink total amount exceeds the above-mentioned predetermined amount of conventions (the amount of absorption limits) by defining the amount of maximum waste ink which may be assumed in one margin-less record as the above-mentioned predetermined value. In this case, it does not stop at reducing an ink overflow, but an ink overflow can be prevented certainly.

[0105] Incidentally, since the amount of waste ink used in one auxiliary discharge appearance actuation or suction actuation is specified, the amount of waste ink by recoveries, such as auxiliary discharge appearance and suction, can be managed comparatively easily.

[0106] Drawing 13 is a flow chart which shows the waste ink management activities in such 1st operation gestalt.

[0107] In drawing 13 , if record data are received from a host computer, a feed device will start feed actuation first. Under the present circumstances, from a host computer, the information on whether record actuation which should be performed is considered as margin-less record of an edge is sent out to record data and coincidence (steps 1, 2, and 3).

[0108] Next, when record data are judged not to be margin-less record data of an edge based on the sent information, delivery actuation is performed after usually performing record actuation (step 5), (step 4) and (step 6). Moreover, in step 4, when record data are judged to be margin-less record data of an edge, the amount information acquisition means of waste ink acquires the amount of waste ink accompanying one margin-less record (here predetermined value), and sends out this predetermined value to a counter once. And the predetermined value of a counter (addition means) smell lever prepared in the control section is added once. (Step 7) .

[0109] what incidentally adds the above-mentioned predetermined value cumulatively for whenever [ of margin-less record of as opposed to the record medium of one sheet in this counter / every ] -- it is -- getting it blocked -- the amount of waste ink accompanying one margin-less record is integrated. Therefore, the accumulation value or addition value in this counter will be equivalent to a waste ink total amount, and a waste ink total amount can be grasped with the accumulation value or addition value in this counter. In addition, as mentioned above, an amount addition means of waste ink to integrate the amount of waste ink breathed out by the platen absorber in this operation gestalt has composition containing the above-mentioned amount information acquisition means of waste ink, and the above-mentioned counter.

[0110] Here, in this 1st operation gestalt, it is desirable to set up most amounts of waste ink which can be considered as a predetermined value (aggregate value) added to a counter when preventing the ink overflow from the platen absorber 13, and since it is that setup, a parameter is used as follows.

- The maximum media size (M1xM2) : A4 (210mmx297mm)
- maximum flash (width-of-face T):tip, back end, left end, right end, and 3mm each, (maximum-delivery E):5ng and maximum placing duty (D): -- 240% [0111] In addition, the above-mentioned maximum media size (M1xM2) points out the maximum size of the record medium which can be used with a recording device, and it is considering as A4 size here. And the flash width of face when using the record medium of this A4 size is specified as the above-mentioned maximum flash width of face (T). Moreover, the above-mentioned maximum delivery (E) is the maximum of the amount of ink which may be breathed out in connection with one discharging. Moreover, the above-mentioned maximum placing duty (D) is the number of the maximum dots which can be driven into per unit area. When record resolution is set to 1200dpi, the unit area of 1/1200 inch around is defined as 1 pixel with this operation gestalt and 1 dot is struck by all 1 pixel on a record medium, it may be placing duty 100%. Therefore, the case where the ink dot of an average of 2.4 shots is driven in to all pixels is pointed out placing duty 240%. In addition, the maximum placing duty is suitably determined according to the ink absorptance of the permeability of ink, or a record medium, the record concentration demanded, and is determined as 240% in this equipment.

[0112] And based on these parameters, the maximum (Vmax) of the amount of waste ink breathed out by overflowing a record medium is computable. Specifically, it asks for the flash area S equivalent to the shadow area of drawing 16 (mm2) first with the size (width-of-face x die length) of the size (width-of-face x die length)-record medium of S= record data. That is, it becomes flash area S= (T+M1+T) (x(T+M2+T)-(M1xM2)).

[0113] Next, it asks for the number X of the maximum ink which may be breathed out to the above-mentioned flash area S (mm2). Here, since 1200dpi (dot/inch) and 1 inch are [ 25.4m and the maximum placing duty ] D %, record resolution becomes number X=Sof maximum ink x(25.4/1200)2x (D/100).

[0114] The maximum (Vmax) of the amount of waste ink finally breathed out by overflowing as Vmax=XxE by carrying out the multiplication of the maximum delivery per drop (E) to this number X of the maximum ink is computed.

[0115] Therefore, when the above is summarized, the maximum amount Vmax of waste ink calculated based on the above-mentioned parameter is Vmax= ((T+M+T)x(T+M2+T)- (M1xM2)).

x(25.4/1200) 2x(D/100) xE = (3+210+3) (x(3+297+3)- (210x297))

x(25.4/1200)2x(240/100) x5 = 82441316 (unit: ng)

= 8.24x107 (unit: ng)

It becomes. whenever [ and / of margin-less record of as opposed to / define this value beforehand as a predetermined value, and / the record medium of one sheet ] -- the account of a top -- the predetermined value defined beforehand is applied to a counter. That is, in performing margin-less record, this predetermined value is added only once

to the waste ink total amount value accompanying the margin-less record to last time, and it calculates the accumulation value of the amount of waste ink at the time of the margin-less record by this time. In addition, the peak (the amount of absorption limits) to which the platen absorber 13 used for this operation gestalt can hold ink is 50g, and this value is beforehand set up as default value.

[0116] Thus, it judges whether the accumulation value acquired by adding the above-mentioned predetermined value Vmax to the waste ink total amount value accompanying the margin-less record to last time only once exceeds the above-mentioned default value (here 5x1010 ng) which is the amount of absorption limits. Consequently, when the accumulation value in a counter is over said default value 5x1010 (ng), record actuation of a printer is suspended (step 10) and warning is emitted to a user so that record actuation to that record medium may not be performed (step 9). Consequently, waste ink can prevent overflowing from the platen absorber 13 certainly. In addition, when the accumulation value in a counter exceeds default value, it is desirable to perform information which stimulates exchange of an ink absorber. On the other hand, when it is judged that the accumulation value in a counter is not over default value at step 8, margin-less record of an edge is performed (step 10), and delivery actuation (step 11) is performed after that.

[0117] In addition, with this 1st operation gestalt, as shown in the flow chart of drawing 13 , before actually performing margin-less record (step 10), the "predetermined value" equivalent to the amount of waste ink accompanying one margin-less record is added (step 7), and it judges whether the accumulation value after addition exceeded the above-mentioned amount of conventions (step 8). Since according to this gestalt the existence of possibility of being full of the ink from an ink absorber can be known before actually performing margin-less record, and it is moreover controlling not to perform margin-less record when it may be an ink overflow from an ink absorber (that is, when the accumulation value after addition exceeds the amount of conventions), an ink overflow can be prevented certainly.

[0118] Since it is considering as the configuration which computes a waste ink total amount by adding the amount of waste ink accompanying the margin-less record (predetermined value) to a counter only once for whenever [ of the margin-less record over the record medium of one sheet / every ] according to the 1st operation gestalt explained above Compared with the configuration which computes a waste ink total amount by adding separately the amount of waste ink breathed out by each four-directions edge of a record medium, shortening of the processing time which calculation processing of a waste ink total amount takes, and simplification of processing are realizable. Moreover, since the amount of maximum waste ink which may be assumed in one margin-less record as a "predetermined value" equivalent to the amount of waste ink accompanying one margin-less record is set up, it can prevent certainly that a waste ink total amount exceeds the above-mentioned amount of

conventions (the amount of absorption limits), and an ink overflow can be prevented certainly.

[0119] (2nd operation gestalt) With the operation gestalt of the above 1st, it was not concerned with the size of a record medium, but constant value was used as a "predetermined value" added at every one margin-less record. The amount of maximum waste ink which can be assumed when the record medium of the maximum size (A4 size) which can be used with this equipment is specifically used was set up as a "predetermined value." In the case of this gestalt, the waste ink from an ink absorber overflows and there is an advantage that ** can be prevented certainly. However, although it is sufficient if the value smaller than the above-mentioned predetermined value as an amount of waste ink is added since there are few actual amounts of waste ink generated in one margin-less record than the above-mentioned predetermined value when the record medium of size (for example, A5 size) smaller than the maximum size (A4 size) is used Since it is not concerned with the size of a record medium but a fixed predetermined value is added with the operation gestalt of the above 1st, in spite of being the waste ink total amount which is extent which an ink overflow does not generate It will be judged that the accumulation value of a waste ink total amount exceeds the above-mentioned default value (the amount of absorption limits), and this will be obliged to a halt of record actuation. Such a gestalt is desirable if the ink overflow from an ink absorber is carried out from a viewpoint prevented certainly, but on the other hand the turnover rate of an ink absorber will increase it. If reduction of the turnover rate of an ink absorber is thought as important, the gestalt which can drive in a waste ink total amount to near the limitation which does not exceed the above-mentioned default value is desirable.

[0120] Then, suppose that the predetermined value from which the plurality corresponding to the size of a record medium differs is used in this 2nd operation gestalt as an aggregate value added at every one margin-less record not using a fixed predetermined value. That is, the predetermined value to add is changed according to the size of a record medium. Referring to the table (data table as shown in the following table 1) on which the size and the predetermined value of a record medium were associated based on the size information on this record medium, if an ink jet recording device specifically receives the information about the size of the record medium chosen by the user in the driver display screen of a host computer, he determines the predetermined value corresponding to the size of a record medium, and is trying to add the determined predetermined value.

[0121] Since the flow chart of the amount management of waste ink in this 2nd operation gestalt is almost the same as drawing 13 which gave [ above-mentioned ] explanation, that drawing is omitted. As difference, it sets in this 2nd operation gestalt. ** In steps 1 and 2 of drawing 13 , in addition to the information on whether it is margin[ record data and ]-less record, receive the information about the size of a record

medium and set to the ** step 4. It is adding the predetermined value corresponding to the size of a record medium rather than in addition to decision whether it being margin-less record, judging size of a record medium, not being concerned with the size of a record medium in the ** step 7 and adding a fixed predetermined value. In detail, the amount information acquisition means of waste ink acquires the predetermined value corresponding to the size of a record medium. And the predetermined value corresponding to the size of this record medium is sent out once to a counter. And the predetermined value of a counter (addition means) smell lever is added once.

[0122] As a predetermined value corresponding to the size of a record medium, it is as being shown in the following table 1. That is, a value which is different corresponding to different size as a "predetermined value" equivalent to the amount of waste ink accompanying one margin-less record is established. Here, the predetermined value corresponding to each size is also large with X4, X3, X2, and X1 as the size of a record medium becomes large with L seal, a postcard, A5, and A4. As mentioned above, it is for performing the highly precise amount management of waste ink to change the predetermined value according to the size of a record medium in this operation gestalt compared with the operation gestalt of the above 1st. that is, since the above-mentioned flash area S differs according to the size of a record medium and the "predetermined values" which is equivalent to the amount of waste ink accompanying one margin-less record in connection with it differ, in order to perform the highly precise amount management of waste ink, the direction adding the optimal predetermined value corresponding to the size of a record medium is markedly more alike rather than adding the same fixed predetermined value, without taking the size of a record medium into consideration, and dominance. In addition, addition of these predetermined value is performed only once like the operation gestalt of the above 1st for whenever [ of the margin-less record over the record medium of one sheet / every ].

[0123]

[Table 1]

| 記録能体のサイズ(mm×mm) | 所定値 |
|---|---|
| A4(210×297) | X1(>X2) |
| A5(148×210) | X2(>X3) |
| はがき(100×148) | X3(>X4) |
| L判(89×127) | X4 |

[0124] As a "predetermined value" which is added at every margin-less record over the record medium of one sheet according to this 2nd operation gestalt as explained above Since the predetermined value from which the plurality corresponding to the size of a record medium differs is established and he is trying to add the optimal predetermined value according to the size of the record medium to be used, compared with the gestalt which adds the same fixed predetermined value regardless of the size of a record medium, precise management of the amount of waste ink is attained. Consequently, a

waste ink total amount can be driven in to near the limitation which does not exceed the absorption limit value (default value) of an ink absorber, and the effectiveness of reduction which is the turnover rate of an ink absorber can be acquired.

[0125] (3rd operation gestalt) With this 3rd operation gestalt, it is characterized by for the value (aggregate value) added at every one margin-less record setting, and carrying out it based on at least the classes (a regular paper, glossy paper, coat paper, etc.) of record medium, and one side of recording modes (fast mode, a canonical mode, high-definition mode, etc.). With this operation gestalt, the amount of ink placing changed with the classes and recording modes of a record medium, and since the amounts of waste ink breathed out by overflowing in connection with it also differ, the above-mentioned aggregate value has been defined in consideration of the class and recording mode of a record medium.

[0126] Hereafter, the 3rd operation gestalt is explained, referring to drawing 14 . In addition, also in this operation gestalt, while having the fundamental configuration shown in drawing 1 thru/or drawing 10 like the 1st operation gestalt, it has the configuration of a platen 10 shown in drawing 11 and drawing 12 .

[0127] Here, the waste ink management activities at the time of performing margin-less record of an edge with the ink jet recording apparatus of this invention are explained with reference to the flow chart of drawing 14 . If record data are received from a host computer, a feed device will operate and a record medium P will be sent to a platen 10. Under the present circumstances, from a host computer, the class of record medium used for record, a recording mode, the information on whether the record which should be performed is margin-less record of an edge, the size (die length, width of face) of record data, and the size (die length, width of face) of a record medium are sent to record data and coincidence (steps 21, 22, and 23). In addition, as shown in the following table 2 and Table 3, the case where the mode 1, the mode 2, the mode 3, the mode 4, and the mode 5 are included is assumed as a recording mode as a class of record medium here including a regular paper, glossy paper, and coat paper.

[0128] Here, the recording mode is explained. It sets in this operation gestalt, and a recording mode is set up when a user operates it on the user interface screen on the display of a host computer (driver display screen). For example, on a display, a driver screen as shown in drawing 17 (A) is displayed, and the recording mode corresponding to that grace is set up because a user chooses desired grace in this display screen. Here, the mode 1 is the fast mode which attached greater importance than to image quality to the recording rate, and while a recording rate falls as it becomes the mode 2, the mode 3, and the mode 4, its record grace improves. And the mode 5 is the high-definition mode which can record the highest image quality, while a recording rate is slow. Thus, a setup of the recording mode which is five from which image quality and a recording rate differ is enabled, and it consists of these operation gestalten so that image quality and a recording rate can be set up in five steps.

[0129] Moreover, you may enable it to set up by the three-stage "it is quick", a "criterion", and "beautiful" in the display screen as shown in drawing 17 (B). In this case, it is desirable to match the above-mentioned recording mode with each "it is quick", a "criterion", and "beautiful", for example, it is desirable to constitute so that the mode 1 (fast mode) will be set up if "it is quick" is chosen, the mode 3 (canonical mode) will be set up if a "criterion" is chosen, and the mode 5 (high-definition mode) may be set up, if "it is beautiful" is chosen. In addition, these recording modes are set up by choosing the check box on the display screen of drawing 17 .

[0130] By the way, as mentioned above, record grace becomes high while a recording rate is slow in high-definition mode compared with fast mode. This originates in making [ many ] the count of horizontal scanning of a recording head (numbers of passes) rather than fast mode in high-definition mode. By making [ many ] numbers of passes, the number of nozzles used for formation of one line increases, and the variation in the ink discharge quantity from the part nozzle is mitigated, consequently concentration nonuniformity decreases. thus -- like the mode in which grace is thought as important with this operation gestalt -- numbers of passes -- many -- carrying out -- getting it blocked -- like the mode in which make the numbers of passes in high-definition mode (mode 5) into the most numerous, and a recording rate is thought as important on the other hand -- numbers of passes -- few -- getting it blocked -- the numbers of passes of fast mode (mode 1) are made into min.

[0131] Moreover, with this operation gestalt, as shown in Table 2, according to a recording mode, the amount of the maximum placing (the maximum placing duty) is changed. In detail, compared with fast mode (mode 1), the amount of the maximum placing in high-definition mode (mode 5) is made [ many ]. This is because the amount of ink recordable, so that the amount of the maximum placing increases increases and the record concentration which is one of the important parameters of image quality improves in connection with it. On the other hand, if the amount of the maximum placing is made [ many ] in fast mode with few numbers of passes (mode 1), an ink blot will occur without driving in many ink for a short time, then a record medium being able to absorb ink, and image quality will be degraded sharply. Therefore, in fast mode with few numbers of passes (mode 1), the amount of the maximum placing is not made but many make it the small amount of the maximum placing compared with high-definition mode (mode 5).

[0132] In addition, even if it embraces the class (a regular paper, glossy paper, coat paper) of the foil and record medium only by changing the maximum placing duty (%) with this operation gestalt according to a recording mode it being shown in Table 2, the maximum placing duty (%) is changed. In changing the maximum placing duty (%) in a regular paper, glossy paper, and coat paper, it is because ink absorptance differs with each record medium. For example, if its attention is paid to the mode 1, since ink absorptance of coat paper is comparatively high, it makes the amount of the maximum

placing 240%. On the other hand, since it is low compared with coat paper, if the amount of the maximum placing is made into 240%, an ink blot will generate the ink absorptance of a regular paper. Then, the amount of the maximum placing of a regular paper is made into 180% fewer than the amount of the maximum placing of coat paper.

[0133]

[Table 2]

最大打ち込みデューティ（%）

| 記録モード | メディア種類 | | |
|---|---|---|---|
| | 普通紙 | 光沢紙 | コート紙 |
| モード1 | 180(%) | 200(%) | 240(%) |
| モード2 | 180(%) | 200(%) | 240(%) |
| モード3 | 180(%) | 200(%) | 240(%) |
| モード4 | 200(%) | 200(%) | 240(%) |
| モード5 | 200(%) | 220(%) | 240(%) |

[0134]

[Table 3]

設定値

| 記録モード | メディア種類 | | |
|---|---|---|---|
| | 普通紙 | 光沢紙 | コート紙 |
| モード1 | 9 | 10 | 12 |
| モード2 | 9 | 10 | 12 |
| モード3 | 9 | 10 | 12 |
| モード4 | 10 | 10 | 12 |
| モード5 | 10 | 11 | 12 |

[0135] At step 24 of drawing 14 , it judges whether record data are margin-less record of an edge based on the data transmitted from the host computer. Here, when record data are judged not to be margin-less record of an edge, according to a recording mode, paper is delivered by performing record (record with a margin of an edge, the so-called usual record) in which a margin is formed along the whole edge of a record medium, and actuation is ended. On the other hand, when it is judged at step 24 that it is margin-less record of an edge, with reference to the table which has the set point corresponding to the class of a recording mode and a record medium as shown in Table 3, the above-mentioned set point is determined according to the information about the class of received record medium, and the information about a recording mode, and the value (aggregate value) which should be added to a counter based on this set point is computed (step 27). Here, the aggregate value to a counter is computed as follows.

[0136] In computing an aggregate value, first, as explained using drawing 16 , the flash area S is computed by flash area S=(die length of width-of-face x record data of record data)- (the die length of the width-of-face x record medium of a record medium). Then, the aggregate value added at every one margin-less record is computed by carrying out the multiplication of the set point defined according to the class and recording mode of this flash area S and a record medium. In addition, as the above-mentioned set point, in

order to prevent the overflow of the ink from an ink absorber, it is desirable to set up the value equivalent to the maximum amount of waste ink which may actually be driven in. In the case of this 3rd operation gestalt, the maximum delivery in one discharging is set to 5ng(s), and according to the class and recording mode of a record medium, the maximum placing duty is defined as shown in Table 2, and it is carried out. For this reason, the set point (biggest value that may actually happen) is converted as follows from the maximum placing duty defined by the class and recording mode of a record medium, and maximum-delivery 5ng.

Set point = the maximum placing duty (%) / 100 x Maximum delivery (5ng)

According to an upper type, the value converted from Table 2 and a maximum delivery is equivalent to the set point shown in Table 3.

[0137] Thus, after computing an aggregate value (set point of the flash area Sx table 3), margin-less record of an edge is started (step 28). If record actuation is completed and delivery is performed (step 29), the aggregate value by which calculation was carried out [ above-mentioned ] will be sent out by the amount information acquisition means of waste ink to a counter, and the sent-out aggregate value will be applied to a counter (step 30).

[0138] And it judges whether the amount of conventions (it is the same as that of the 1st operation gestalt, and is 5x1010ng) was exceeded (step 31), and if the accumulation value in a counter has not exceeded and it ends and is over control action, it will emit warning to a user (step 32), and will end control action.

[0139] In addition, although the above explained the example which computes an aggregate value by carrying out the multiplication of the set point and the flash area S for whenever [ of one margin-less record / every ], this operation gestalt is not limited to this example. For example, the table (table of the following table 4) which matched the aggregate value (A1<A2<A3<A4) added for whenever [ of one margin-less record / every ], and the class and recording mode of a record medium is prepared beforehand, and you may make it choose the optimal aggregate value according to the class and recording mode of a record medium to be used, referring to this table. In other words, it is good also as a configuration which establishes beforehand the predetermined value from which the plurality corresponding to the class and recording mode of a record medium differs as a value added at every one margin-less record, chooses the predetermined value which corresponds according to the class and recording mode of a record medium to be used, and adds this predetermined value. In the case of this gestalt, since the multiplication process is unnecessary, compaction of the processing time is realizable. In addition, the following table 4 shows the aggregate value in case the flash area S is a predetermined area, and it cannot be overemphasized that aggregate values differ according to the flash area S as mentioned above. In the case of this gestalt, the amount information acquisition means of waste ink acquires the predetermined value corresponding to the class and recording mode of a record medium, and sends out this

predetermined value to a counter. And in a counter (addition means), the predetermined value corresponding to the class and recording mode of a record medium will be added.

[0140]

[Table 4]

加算値

| | メディア種類 | | |
|---|---|---|---|
| 記録モード | 普通紙 | 光沢紙 | コート紙 |
| モード1 | A1 | A2 | A4 |
| モード2 | A1 | A2 | A4 |
| モード3 | A1 | A2 | A4 |
| モード4 | A2 | A2 | A4 |
| モード5 | A2 | A3 | A4 |

[0141] Moreover, although explained as what defines above the aggregate value added at every one margin-less record by both the class of record medium, and the recording mode, and is carried out, the above-mentioned aggregate value is good also as what is defined by at least the class of record medium, and one side of a recording mode. for example, when it does not break between recording modes if the amount of ink placing is changed, but the amount of ink placing is changed according to the class of record medium A recording mode should just define the above-mentioned aggregate value according to the class of record medium, without taking into consideration, and On the other hand, between the classes of record medium, when it does not break if the amount of ink placing is changed, but the amount of ink placing is changed according to record-medium mode, the class of record medium should just define the above-mentioned aggregate value by the recording mode, without taking into consideration.

[0142] Furthermore, if it adds, the values (aggregate value) added at every one margin-less record differ according to the flash area S as above-mentioned. And these flash area S differs according to the size of record data, and the size of a record medium. Therefore, it is desirable in addition to the above-mentioned class and above-mentioned recording mode of a record medium, to also take into consideration the size of record data and the size of a record medium, and to determine an aggregate value. Then, it is good also as a configuration which determines one predetermined value defined with the size of the class of record medium to be used, a recording mode, and record data, and the size of a record medium, and adds this predetermined value, storing beforehand in the table two or more predetermined values defined with the size of the class of record medium, a recording mode, and record data, and the size of a record medium, and referring to this table. In the case of this gestalt, the amount information acquisition means of waste ink acquires the predetermined value corresponding to the size of the size and the record medium of the class, the recording mode, and record data of a record medium, and sends out this predetermined value to a counter. And in a counter (addition means), the predetermined value corresponding to the size of the size and the record

medium of the class, the recording mode, and record data of a record medium will be added.

[0143] Since the value (aggregate value) added at every one margin-less record is defined in consideration of the class and recording mode of a record medium according to this 3rd operation gestalt as explained above, compared with the case where it sets regardless of the class and recording mode of a record medium, management of the more exact amount of waste ink is realizable.

[0144] (4th operation gestalt) With this 4th operation gestalt, it is characterized by for the value (aggregate value) added at every one margin-less record setting, and carrying out it based on record duty. With this operation gestalt, the amount of ink placing changed with record duty, and since the amounts of waste ink breathed out by overflowing in connection with it also differ, the aggregate value has been defined in consideration of record duty.

[0145] Hereafter, it explains, referring to a flow chart given [ the 4th operation gestalt of this invention ] in drawing 15 . In addition, also in this operation gestalt, while having the fundamental configuration shown in drawing 1 thru/or drawing 10 like said each operation gestalt, it has the configuration of a platen 10 shown in drawing 11 and drawing 12 .

[0146] Here, the waste ink management activities in this 4th operation gestalt are explained, referring to drawing 15 . If record data are received from a host computer, a feed device will operate and a record medium P will be sent to a platen 10. Under the present circumstances, from a host computer, the information on whether the record which should be performed is margin-less record of an edge, the size (die length, width of face) of record data, and the size (die length, width of face) of a record medium are sent to record data and coincidence (steps 41, 42, and 43). And when it is judged that record data are not margin-less record data of an edge in step 44, it usually records (step 45), and delivery actuation 46 is performed and it ends. Moreover, in step 44, when record data are judged to be margin-less record data of an edge, the flash area S of record is computed first (step 47). Namely, flash area S= (width of face of the die-length x record data of record data) - (width of face of the die-length x record medium of a record medium)

The flash area S is computed as be alike.

[0147] Next, while breathing out ink and performing record actuation from a recording head H1001 based on the record data sent out from a host, the number of dots breathed out in this record actuation is counted (step 48). Then, if record actuation is completed and delivery actuation is performed (step 49), the rate D of average record (record duty) will be computed from the number of dots and record data size (area) which were counted previously (step 50). This is called for by the number of D= dots / record data surface product. That is, this value means the number of average dots per unit area.

[0148] Then, an aggregate value is computed by carrying out the multiplication of the

record flash area S, and the rate D of average record and the discharge quantity (this 4th operation gestalt 5 ng(s)) of 1 dot. Here, the computed aggregate value is sent out by the amount information acquisition means of waste ink to a counter, and adds this sent-out aggregate value to a counter (step 51). In the ink jet recording device in this 4th operation gestalt Since the amount of maximum ink maintenance (default value) which the ink absorber 13 formed in the platen 10 can absorb and hold is 50g, Since waste ink may overflow from the ink absorber 13 when the ink absorber counter which shows the accumulation value after addition is over the above-mentioned default value (5x1010ng), record actuation is suspended, warning is emitted to a user (step 53), and ink management activities are ended.

[0149] In addition, it is good also as a configuration which also takes conditions other than this into consideration, and defines the above-mentioned aggregate value in addition to record duty with this operation gestalt. As conditions other than record duty, the conditions of a publication are mentioned to the operation gestalt of the above 3rd, for example. Specifically, it is good also as a configuration which defines the above-mentioned aggregate value in consideration of at least one condition of the size of the class of record medium, a recording mode, and record data, and the size of a record medium in addition to record duty.

[0150] Since the value (aggregate value) added at every one margin-less record is defined in consideration of record duty according to this 4th operation gestalt as explained above, compared with the case where it sets regardless of record duty, management of the more exact amount of waste ink is realizable.

[0151] Moreover, in computing said rate D of average record, it is good for the flash section also as calculation of the rate D of average record in a nearer field being possible by using the fixed dot count range for enabling a setup of the magnitude of the range (record data surface product) which counts the number of dots, and a location to arbitration in a main scanning direction and the direction of vertical scanning, or computing power consumption etc. In this case, the improvement in precision of the rate D of average record can be expected further, and management of the more exact amount of waste ink becomes expectable.

[0152] (5th operation gestalt) With this 5th operation gestalt, in order to grasp the amount of waste ink correctly as much as possible, the aggregate value equivalent to the amount of waste ink accompanying one margin-less record is computed by carrying out counting of the number of ink regurgitation corresponding to a flash field (N), and carrying out the multiplication of the ink discharge quantity per drop (E) to this number of ink regurgitation (N).

[0153] In this configuration, as the operation gestalt of the above 1st described, when the conveyance error of a record medium is large, the number of ink regurgitation (N) which carried out counting, and the number of ink regurgitation actually breathed out by the flash field may be different. However, when the conveyance precision of a record

medium is high, there is also little gap with the number of ink regurgitation (N) which carried out counting, and the number of ink regurgitation actually breathed out by the flash field. therefore, number of ink regurgitation (N) x on the printer by which conveyance precision can suppress a conveyance error small highly, and corresponding to a flash field -- it is desirable to calculate an aggregate value by the ink discharge quantity per drop (E). According to this gestalt, the amount of waste ink can be grasped correctly.

[0154] (6th operation gestalt) With this 6th operation gestalt, it has the function in which the amount of the flash field shown with the slash of drawing 16 can be adjusted, and the case where flash area is changed by adjustment of this amount of flashes is explained.

[0155] First, the adjustment function of the amount of flashes is explained using drawing 18 . Drawing 18 is a user interface screen (display screen on a host's display) for adjusting the amount of flashes. In this example, a user interface screen like drawing 18 (b) is displayed as the display screen for specifying the amount of flashes. The amount of flashes is specified by dragging the tongue K on the display screen to right and left with cursor, after a user specifies the assignment item of the amount of flashes with cursor as a setting item so that it may mention later. About the example of the specification method, it mentions later. Moreover, when FUCHI-less printing is not specified, a user interface screen like drawing 18 (a) is displayed. In the screen of this drawing 18 (a), a tongue K is not displayed and assignment of the amount of **** broths cannot be performed.

[0156] In this example, by doubling Cursor C with a part for the display about the amount of flashes in the screen of drawing 18 (b), and carrying out click actuation, the assignment item of the amount of flashes turns into a setting item, and a user interface screen like drawing 18 (c) is displayed as a guide screen of the amount of flashes of printer recommendation instead of the screen of drawing 18 (b).

[0157] "recommendation of the amount of flashes of printer recommendation is a right end by the alphabetic character all over the screen of this drawing 18 (c). The amount of flashes decreases, so that it drags to the left. It is displayed as ". And four steps (from the 1st step to the 4th step) of the amounts of flashes corresponding to the location of that tongue K are alternatively specified by dragging the tongue K on the display screen of this drawing 18 (c) with Cursor C, and making it located in either of four locations P1, P2, P3, and P4.

[0158] Thus, the size of record data is changed according to four steps of the amounts of flashes specified. Then, flash area is also changed with size change of this record data. That is, as described above, the flash area S is the size (width-of-face x die length) of the size (width-of-face x die length)-record medium of flash area S= record data.

Be alike is computed. Therefore, if the size of record data is changed, the flash area S will be changed along with it.

[0159] And if the flash area S is changed, naturally the amount of waste ink breathed out by the flash field will also be changed. Therefore, it is more desirable to also change collectively the aggregate value added to a counter as an amount of waste ink, when adjustment of the amount of flashes is performed and the flash area S is changed. That is, it is desirable to make it correspond to the flash area S, and to define the value of an aggregate value. And if it takes into consideration that this flash area S is specified in the size of record data, and the size of a record medium, it will be drawn that it is desirable to define an aggregate value according to both the size of record data and the size of a record medium after all.

[0160] Then, suppose that the predetermined value from which the plurality corresponding to the size of record data and the size of a record medium differs is used in this 6th operation gestalt as an aggregate value added at every one margin-less record not using a fixed predetermined value. That is, the predetermined value to add is changed according to the size of record data, and the size of a record medium. Specifically referring to the table on which the size of record data and the size of a record medium, and a predetermined value were associated based on the size information on this record data, and the size information on a record medium, if an ink jet recording apparatus receives the information about the size of record data, and the size of a record medium, he chooses the predetermined value corresponding to the size of record data, and the size of a record medium, and is trying to add that predetermined value.

[0161] In the case of this gestalt, the amount information acquisition means of waste ink acquires the predetermined value corresponding to the size of the size and the record medium of record data, and sends out this predetermined value to a counter. And in a counter (addition means), the predetermined value corresponding to the size of the size and the record medium of record data will be added.

[0162] According to the 6th operation gestalt explained above, since the value (aggregate value) added at every one margin-less record is defined in consideration of record data size and the size of a record medium, compared with the case where it sets regardless of record data size and the size of a record medium, management of the more exact amount of waste ink is realizable.

[0163] (Other operation gestalten) above-mentioned the 1- in the 6th operation gestalt, it explained performing a halt of warning actuation and record actuation. The activation timing of halt control of this warning actuation and record actuation has the following desirable timing. That is, it is desirable to perform warning actuation, when the accumulation value of the amount of waste ink obtained by the amount addition means of waste ink reaches the 1st default value of under the maximum ink absorbed amount of a platen absorber, and to perform halt control of record actuation, when the 2nd larger default value which is below the maximum ink absorbed amount of a platen absorber than said 1st default value is reached.

[0164] in addition, above-mentioned the 1- with the 6th operation gestalt, the gestalt with which the waste ink at the time of margin-less record and the waste ink at the time of recovery are held at a separate ink absorber is assumed. Since it was absorbed and held at the ink absorber (platen absorber 13) with which all the waste ink generated in margin-less record of an edge was prepared independently in the platen 10 in the case of this gestalt, the aggregate value (predetermined value) and the amount of absorption limits of the platen absorber 13 (default value) which are added at every one margin-less record were set up only supposing the amount of waste ink driven into the platen absorber 13. Moreover, the amount addition means of waste ink for integrating the amount of waste ink shall also integrate only the amount of the waste ink breathed out by the platen absorber 13. In detail, the amount addition means of waste ink acquires the information (that is, aggregate value added at every one margin-less record) about the amount of waste ink accompanying one margin-less record, and consists of an amount information acquisition means of waste ink send out this information to a counter, and a counter which integrates the information (aggregate value) sent out by the amount information acquisition means of waste ink. Thus, with each above-mentioned operation gestalt, the amount management of waste ink by the platen absorber independent is realized.

[0165] However, this invention is not limited to the above-mentioned gestalt, and can be applied also to the gestalt with which both the waste ink at the time of recovery and the waste ink waste ink at the time of margin-less record are held in the ink absorber (waste ink absorber) which collects the waste ink at the time of recoveries, such as auxiliary discharge appearance actuation and suction recovery action. In addition, a recovery means to perform recovery which makes ink discharge is arranged from recording heads, such as auxiliary discharge appearance actuation and suction recovery action, in the location outside a record section (for example, home position).

[0166] This gestalt is shown in drawing 19 . Although the waste ink generated with margin-less record is absorbed with the platen absorber 1901, it is first dropped at the waste ink absorber 1902 after that according to gravity, so that clearly from drawing 19 . That is, the waste ink generated with margin-less record will result in the waste ink absorber 1902 through the platen absorber 1901, and will be held with this waste ink absorber 1902. On the other hand, naturally the waste ink at the time of recovery is also held with the waste ink absorber 1902. Therefore, in the case of this gestalt, in the waste ink absorber 1902, both the waste ink at the time of margin-less record and the waste ink at the time of recovery will be held. In addition, the waste ink absorber 1902 is arranged at the lower part section in the gravity direction of a platen absorber established in the ink receptacle section so that clearly from drawing.

[0167] In addition, in drawing 19 , 1903 shows the recovery unit which performs suction recovery action to a recording head, and this recovery unit 1903 is equipped with the pump 1904 which is open for free passage to said waste ink absorber 1902, the

cap 1905 which seals the head nozzle section of a recording head. Moreover, 1906 is an auxiliary discharge appearance receptacle which receives the ink breathed out from a recording head in the auxiliary discharge appearance actuation performed before record actuation etc. This auxiliary discharge appearance receptacle 1906 was constituted by ink absorbers, such as sponge, and that lower limit section is in contact with said ashes ink absorber 1901.

[0168] In the case of this gestalt, it is desirable to manage the amount of waste ink in the waste ink absorber 1902 to which both the waste ink at the time of margin-less record and the waste ink at the time of recovery are led. The absorption limit value of a waste ink absorber is set to the above-mentioned default value defined as a threshold of an ink overflow in that case. Moreover, the value which added together the amount of the waste ink at the time of margin-less record and the amount of the waste ink at the time of recovery is equivalent to a waste ink total amount, therefore it judges whether this total value exceeds the above-mentioned default value, and an error will be reported when it exceeds.

[0169] In addition, in the case of this gestalt, the amount addition means of waste ink is constituted so that both the amount of waste ink at the time of margin-less record and the amount of waste ink at the time of recovery may be integrated. In detail, besides the information (the 1st value) about the amount of waste ink at the time of margin-less record, an amount information acquisition means of waste ink to constitute the amount addition means of waste ink also acquires the information (the 2nd value) about the amount of waste ink at the time of recovery, and it is constituted so that not only the 1st aggregate value of the above but the 2nd aggregate value can be sent out to a counter. Moreover, it is constituted so that the 2nd aggregate value may also be integrated besides the 1st aggregate value in a counter.

[0170] and such a gestalt (gestalt with which both the waste ink at the time of margin-less record and the waste ink at the time of recovery are held at a waste ink absorber) -- above-mentioned the 1- it is applicable to all of the 6th operation gestalt. What is necessary is just to replace with the configuration which manages the amount of waste ink in a platen absorber on the occasion of this application, and to adopt the configuration which manages the amount of waste ink in a waste ink absorber.

[0171] For example, when applying the 1st operation gestalt, the amount addition means of waste ink adds the 2nd predetermined value (the 2nd value) equivalent to the amount of waste ink accompanying this recovery for whenever [ of recovery / every ] while adding the above-mentioned predetermined value (the 1st value) for whenever [ of one margin-less record / every ]. Thus, it acts so that the amount of waste ink accompanying margin-less record and the amount of waste ink accompanying recovery may be added together and a waste ink total amount may be calculated. And it judges whether this waste ink total amount exceeds the amount of conventions (the amount of absorption limits in a waste ink absorber), and in exceeding, it warns of the display to

which the maintenance of an ink absorber is urged.

[0172] Moreover, when applying the 2nd operation gestalt, the amount addition means of waste ink adds the 2nd value equivalent to the amount of waste ink accompanying this recovery for whenever [ of recovery / every ] while adding the 1st value corresponding to the size of a record medium for whenever [ of one margin-less record / every ]. Thus, it acts so that the amount of waste ink accompanying margin-less record and the amount of waste ink accompanying recovery may be added together and a waste ink total amount may be calculated. And it judges whether this waste ink total amount exceeds the amount of conventions (the amount of absorption limits in a waste ink absorber), and in exceeding, it warns of the display to which the maintenance of an ink absorber is urged.

[0173] Moreover, when applying the 3rd operation gestalt, the amount addition means of waste ink adds the 2nd value equivalent to the amount of waste ink accompanying this recovery for whenever [ of recovery / every ] while adding the 1st value corresponding to the class and recording mode of a record medium for whenever [ of one margin-less record / every ]. Thus, it acts so that the amount of waste ink accompanying margin-less record and the amount of waste ink accompanying recovery may be added together and a waste ink total amount may be calculated. And it judges whether this waste ink total amount exceeds the amount of conventions (the amount of absorption limits in a waste ink absorber), and in exceeding, it warns of the display to which the maintenance of an ink absorber is urged.

[0174] Moreover, when applying the 6th operation gestalt, the amount addition means of waste ink adds the 2nd value equivalent to the amount of waste ink accompanying this recovery for whenever [ of recovery / every ] while adding the 1st value corresponding to the size of a record medium, and the size of record data for whenever [ of one margin-less record / every ]. Thus, it acts so that the amount of waste ink accompanying margin-less record and the amount of waste ink accompanying recovery may be added together and a waste ink total amount may be calculated. And it judges whether this waste ink total amount exceeds the amount of conventions (the amount of absorption limits in a waste ink absorber), and in exceeding, it warns of the display to which the maintenance of an ink absorber is urged.

[0175] In addition, since the same is said of the 4th operation gestalt and the 5th operation gestalt, the explanation is omitted.

[0176] Moreover, the timing which performs halt control of the warning actuation which shows that the amount of waste ink in a waste ink absorber is approaching the limitation, and record actuation has the following desirable timing. That is, it is desirable to perform warning actuation, when the accumulation value of the amount of waste ink obtained by the amount addition means of waste ink reaches the 1st default value of under the maximum ink absorbed amount of a waste ink absorber, and to perform halt control of record actuation, when the 2nd larger default value which is

below the maximum ink absorbed amount of a waste ink absorber than said 1st default value is reached.

[0177] moreover, above-mentioned the 1- although it was made to make a counter accumulate with the 6th operation gestalt by making into an aggregate value the amount of waste ink produced by record to the record medium of one sheet, the amount of waste ink produced by record to the record medium of two or more sheets may be set up as an aggregate value. That is, what is necessary is just to set up the amount of the waste ink produced with the margin-less record over a record medium in the predetermined number of sheets defined beforehand as an aggregate value. Moreover, it is also possible to set up the amount of waste ink produced by record to the record section (every [ for example, ] 1/2 page or scan) of one or less sheet as an aggregate value.

[0178] moreover, above-mentioned the 1- with the 6th operation gestalt, although waste ink management activities were made to process by the body of a recording device, they may carry out processing which coils round waste ink management by the host side. That is, after performing various processings of point ** within a printer driver, effectiveness is not spoiled even if it is the recording apparatus of the format of transmitting record data and the amount of flash ink to a recording apparatus.

[0179] In addition, although the case where record which forms a margin in no edges (for example, four sides) of a record medium was performed in the above-mentioned operation gestalt was taken and explained to the example Also when forming the image with which the part which does not have a margin only in the part in the part in the edge of a record medium, for example, one side, and one side exists, this invention is effective and is set on these specifications. Margin-less record of an edge means the record in which the part which does not have a margin at least in the part in the edge of a record medium exists.

[0180]

[Effect of the Invention] According to this invention, it can reduce that the ink (waste ink) breathed out by overflowing a record medium in the case of margin-less record overflows an ink absorber as explained above.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the perspective view showing the appearance configuration of the ink jet printer by one example of this invention.

[Drawing 2] It is the perspective view showing the condition of having removed the sheathing member of the printer shown in drawing 1 .

[Drawing 3] It is the perspective view showing the condition of having assembled the

record head cartlidge used for the printer by one example of this invention.

[Drawing 4] It is the decomposition perspective view showing the record head cartlidge shown in drawing 3 .

[Drawing 5] It is the decomposition perspective view which looked at the recording head shown in drawing 4 from the slanting lower part.

[Drawing 6] It replaces with the record head cartlidge of drawing 3 , and in order to show the configuration of the scanner cartridge which can be carried in the printer by one example of this invention, it is the perspective view showing the scanner cartridge, and (a) shows a top-face side and (b) shows a base side, respectively.

[Drawing 7] It is the block diagram showing roughly the whole electric circuit configuration in the printer of one example of this invention.

[Drawing 8] It is the block diagram showing the example of an internal configuration of Maine PCB among the electrical circuits shown in drawing 7 .

[Drawing 9] It is the block diagram showing the example of an internal configuration of ASIC among Maine PCB shown in drawing 8 .

[Drawing 10] It is the flow chart which shows the example of fundamental actuation of the printer in the example of this invention.

[Drawing 11] It is drawing showing the configuration of the platen applied to the operation gestalt in the characteristic configuration of this invention, and (a) is a partial perspective view and (b) is a vertical section partial side elevation.

[Drawing 12] It is an explanation vertical section side elevation explaining margin-less record actuation of the edge of drawing 11 , and (a) shows the condition that the tip of a record medium arrived at the slot between ribs, (b) shows the condition that ink is breathed out towards the tip and ink absorber of a record medium, and (c) shows the condition that ink is breathed out towards the back end section and the ink absorber of a record medium.

[Drawing 13] It is the flow chart which shows the waste ink management activities in the 1st operation gestalt of this invention.

[Drawing 14] It is the flow chart which shows the waste ink management activities in the 2nd operation gestalt of this invention.

[Drawing 15] It is the flow chart which shows the waste ink management activities in the 3rd operation gestalt of this invention.

[Drawing 16] It is drawing for explaining an example of the calculation approach which computes the predetermined value added to a counter based on media size, flash width of face, discharge quantity, and placing duty.

[Drawing 17] It is the driver display screen of a host computer for setting up a recording mode.

[Drawing 18] It is an explanatory view about the adjustment function of the amount of flashes.

[Drawing 19] It is drawing showing the gestalt which the ink absorber (waste ink

absorber) which collects the waste ink at the time of recovery, and the ink absorber (platen absorber) which collects the waste ink at the time of margin-less record are opening for free passage.

[Description of Notations]

M1000 Body of equipment
M1001 Bottom case
M1002 Top case
M1003 Access cover
M1004 Discharge tray
M2015 Adjusting lever between papers
M2003 Delivery roller
M3001 LF roller
M3019 Chassis
M3022 Automatic feeding section
M3029 Conveyance section
M3030 Discharge section
M4000 Records Department
M4001 Carriage
M4002 Carriage covering
M4007 Head set lever
M4021 Carriage shaft
M5000 Recovery system unit
M6000 Scanner
M6001 Scanner holder
M6003 Scanner covering
M6004 Scanner contact PCB
M6005 Scanner lighting lens
M6006 Scanner reading lens 1
M6100 Box
M6101 Box base
M6102 Box covering
M6103 Box cap
M6104 Box spring
E0001 Carriage motor
E0002 LF motor
E0003 PG motor
E0004 Encoder sensor
E0005 Encoder scale
E0006 Ink and sensor
E0007 PE sensor

E0008 GAP sensor (sensor between papers)
E0009 ASF sensor
E0010 PG sensor
E0011 Contact FPC (flexible printed cable)
E0012 CRFFC (flexible flat cable)
E0013 Carriage substrate
E0014 Maine substrate
E0015 Power supply unit
E0016 Parallel I/F
E0017 Serial I/F
E0018 Power-source key
E0019 Resume key
E0020 LED
E0021 Buzzer
E0022 Covering sensor
E1001 CPU
E1002 OSC (oscillator with a built-in CPU)
E1003 A/D (A/D converter with a built-in CPU)
E1004 ROM
E1005 Oscillator circuit
E1006 ASIC
E1007 Reset circuit
E1008 CR Motor Driver
E1009 LF/PG Motor Driver
E1010 Power control circuit
E1011 INKS (ink and detecting signal)
E1012 TH (thermistor temperature detecting signal)
E1013 HSENS (head detecting signal)
E1014 Control bus
E1015 RESET (reset signal)
E1016 RESUME (resume key input)
E1017 POWER (power-source key input)
E1018 BUZ (buzzer signal)
E1019 Oscillator-circuit output signal
E1020 ENC (encoder signal)
E1021 Head control signal
E1022 VHON (head power-source ON signal)
E1023 VMON (motor power-source ON signal)
E1024 Power control signal
E1025 PES (PE detecting signal)

E1026 ASFS (ASF detecting signal)
E1027 GAPS (GAP detecting signal)
E0028 Serial I/F signal
E1029 Serial I/F cable
E1030 Parallel I/F signal
E1031 Parallel I/F cable
E1032 PGS (PG detecting signal)
E1033 PM control signal (pulse motor control signal)
E1034 PG motorised signal
E1035 LF motorised signal
E1036 CR motor control signal
E1037 CR motorised signal
E0038 LED driving signal
E1039 VH (head power source)
E1040 VM (motor power source)
E1041 VDD (logic power source)
E1042 COVS (covering detecting signal)
E2001 CPU I/F
E2002 PLL
E2003 DMA control section
E2004 DRAM control section
E2005 DRAM
E2006 1284 I/F
E2007 USB I/F
E2008 Reception-control section
E2009 Compression and expanding DMA
E2010 Receive buffer
E2011 Work-piece buffer
E2012 Work area DMA
E2013 Record buffer transfer DMA
E2014 Print buffer
E2015 Record data expansion DMA
E2016 Data buffer for expansion
E2017 Column buffer
E2018 Head control section
E2019 Encoder signal-processing section
E2020 CR motor control section
E2021 LF/PG motor control section
E2022 Sensor signal-processing section
E2023 Motor control buffer

E2024 Scanner incorporation buffer
E2025 Scanner data-processing DMA
E2026 Scanner data buffer
E2027 Scanner data compression DMA
E2028 Sending-out buffer
E2029 Port control section
E2030 LED control section
E2031 CLK (clock signal)
E2032 PDWM (software control signal)
E2033 PLLON (PLL control signal)
E2034 INT (interruput signal)
E2036 PIF received data
E2037 USB received data
E2038 WDIF (received data/raster data)
E2039 Receive buffer control section
E2040 RDWK (receive buffer read-out data / raster data)
E2041 WDWK (work-piece buffer write-in data / record code)
E2042 WDWF (work-piece philharmonic data)
E2043 RDWP (work-piece buffer read-out data / record code)
E2044 WDWP (rearrangement record code)
E2045 RDHDG (data for record expansion)
E2047 WDHDG (column buffer write-in data / expansion record data)
E2048 RDHD (column buffer read-out data / expansion record data)
E2049 Head drive timing signal
E2050 Data expansion timing signal
E2051 RDPM (pulse motor drive table read-out data)
E2052 Sensor appearance signal
E2053 WDHD (incorporation data)
E2054 RDAV (incorporation buffer read-out data)
E2055 WDAV (data buffer write-in data / processed data)
E2056 RDYC (data buffer read-out data / processed data)
E2057 WDYC (sending-out buffer write-in data / compressed data)
E2058 RDUSB (USB transmit data / compressed data)
E2059 RDPIF (1284 transmit data)
H1000 Record head cartlidge
H1001 Recording head
H1100 Record component substrate
H1100T Delivery
H1200 The 1st plate
H1201 Ink feed hopper

H1300 Electric wiring substrate
H1301 External signal input terminal
H1400 The 2nd plate
H1500 Tank electrode holder
H1501 Ink passage
H1600 Passage formation member
H1700 Filter
H1800 Seal rubber
H1900 Ink tank
H1600d Free passage way
H1001 Recording head
P Record medium
10 Platen
11 12 Rib
13 Ink Absorber
14 Slot (Ink Receptacle Section)